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MARGINAL LAND UTILIZATION AND POTENTIAL KENT COUNTY, NEW BRUNSWICK.

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MARGINAL LAND UTILIZATION AND POTENTIAL

KENT COUNTY, NEW BRUNSWICK

Maurice Mandale
with Maritime Resource Management Service
Council of Maritime Premiers

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Land Use Policy and Research Branch
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PREFACE

The agricultural use of Canada's land varies greatly from region to region in its intensity, vitality and economic prospects. During the past few decades there have been major shifts in agricultural land use in Canada; a significant element has been the abandonment of large areas of land formerly in agriculture, principally in eastern Canada (McCuaig and Manning, 1982). Bibliographic research by the Lands Directorate has shown considerable concern related to the abandonment of farmland, the decline of entire regions as much of the population leaves, and the failure to adapt to new methods of using and managing the land resource in extensive rural areas of eastern Canada (Beattie, Bond and Manning, 1981).

As a result, Lands Directorate has undertaken a major research project on the use of marginal agricultural lands in Canada, of which this study is a part. Marginal agricultural lands are defined as those which at a given point in time are at or near the economic margin for agriculture. Goals of the overall research project are:

- to document the extent, capability and current use of abandoned agricultural lands;
- to analyse the physical as well as the socioeconomic causes and consequences of trends in the use of marginal agricultural lands;
- to examine the processes underlying the underutilization or inappropriate use of marginal agricultural lands;
- to overview and analyse the policy and program responses of various government levels in the adjustment of the use of marginal agricultural lands;
- to suggest the types of options available to more effectively use marginal agricultural lands.

The research project involves three case studies in specific representative areas where agricultural land has been recently abandoned in different parts of eastern Canada, including Eastern New Brunswick (particularly Kent County), the Gaspé peninsula (specifically Bonaventure and Matapedia counties) and Renfrew County, Ontario. These case studies, along with historical research, analysis of national level trends, and investigations of the social, economic and environmental factors influencing these trends will be synthesized into a subsequent national overview study.

EXECUTIVE SUMMARY

Conversion of agricultural land to other uses has become a national concern in a country such as Canada with a northerly climate and a reputation as one of the world's bread-baskets. In parts of Atlantic Canada, reasonably good land has been abandoned from agricultural use, usually to grow back to forest. The objective of this report is to analyse this process in a case study of Eastern New Brunswick.

Primary data for the project were generated by means of a land-use survey in part of Kent County, New Brunswick, allied to an interview survey of selected landholders in Kent, and a wider-ranging series of interviews with personnel skilled and experienced in land resource and agricultural management in Eastern New Brunswick. This primary information was integrated with secondary data, mostly from the 1951, 1961, 1971, and 1981 Censuses of agriculture.

The data reveal that agricultural decline has been widespread over much of Atlantic Canada, but especially in Eastern New Brunswick. This has occurred in spite of a reserve of land with good capability for agriculture. The land-use survey revealed that about 50 per cent of all cleared land in part of Kent County was subject to change in use in the 20 years between the early 1960s and the early 1980s, with a large proportion merely reverting to woodland. This abandonment of farmland has not largely discriminated between either location or quality of land.

Major causes of land abandonment were identified as lack of agricultural profitability; a sluggish market in land which inhibited transfer of farmland to commercial farmers; a relatively low level of managerial skills among farmers in Eastern New Brunswick; lack of ability to compete in available markets for agricultural products, including those within the Atlantic region; and the availability of alternative economic opportunities elsewhere in Canada and the United States, which has caused widespread emigration from rural new Brunswick. All these factors, and others, have combined in a cumulative and circular fashion to accelerate the process of land abandonment, once decline was firmly established.

Only in the middle and late 1970s has there been evidence that the process of rural and agricultural decline has been arrested and occasionally reversed. Surviving farms are now bigger, more heavily capitalized, run by more highly trained farmers, and frequently involved in more highly specialized production of both traditional and less-traditional output. In many cases, a variety of strategies have been adopted to enable farmers to remain in agriculture. These have included intensification, specialization, and enlargement. Where the willingness to respond to changed economic circumstances was outweighed by lack of ability to respond, land has been leased out to other farmers, part-time farming has become a way of life, or the land has simply been lost to agriculture.

In an era when Canadian farmers are expected to increase their export potential and contribute to the nation's economic progress, areas such as Kent County and Eastern New Brunswick take on a new importance as an agricultural reserve to be mobilized, both to contribute to supplying local markets with food, and to developing new outside markets. In a region such as Atlantic Canada, with an economy traditionally based on resources, there is potential based on the land resource, and emerging, specialized agriculture in Eastern New Brunswick for an expanded effort to provide more jobs and overall economic security.

RESUME

L'étude examine la nature et les dimensions du problème de l'abandon des terres agricoles dans le comté de Kent. Les auteurs analysent les causes matérielles et socio-économiques du phénomène et tirent des conclusions applicables aux régions marginales d'une bonne partie des provinces de l'Atlantique. L'étude montre que l'utilisation de 50% des terres défrichées du comté de Kent a évolué entre 1963 et 1982 et que la plus grande partie de ces terres est laissée inexploitée ou retourne à l'état de forêt. Principales raisons de cet abandon: faible rentabilité du marché agricole, marché foncier au point mort, insuffisance de savoir-faire en gestion chez les agriculteurs, éloignement des marchés, meilleur potentiel d'emploi hors de la ferme. Toutefois, un certain nombre d'agriculteurs ont su appliquer avec succès diverses stratégies qui leur ont permis de rester rentables: intensification des cultures, spécialisation, agrandissement et exploitation à temps partiel. Les auteurs aboutissent à la conclusion que la région du comté de Kent et d'autres régions semblables dans les provinces de l'Atlantique possèdent une réserve inexploitée de terres propices à la production agricole ou forestière.

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CHAPTER ONE

LAND AS A RESOURCE: SOME CONSIDERATIONS

There is a mystique which surrounds land, and which is accorded to no other resource. Precious metals may excite more emotions, but are not generally more accessible to the great majority of people. Water may be more basic to life, but is more likely to be regarded as a resource held by all, in common. Clean air is regarded as essential to life, too, but is intangible and, once again, regarded as common property.

Land, however, is special. To the classical economists it was the essential resource. David Ricardo used it to demonstrate his concept of economic margins; increased demand for food would bring land of poorer and poorer inherent quality into cultivation, with better quality land commanding a premium which Ricardo termed its economic rent. Thomas Malthus took this analysis to its perceived limits, and predicted distinct restrictions on human expansion based on the capability of land to produce food and fibre. Johan von Thünen explored the relationship of distance from market with intensity of land use.

Modern society has also been imbued with the image of rights in land as private property. Machiavelli was one of the earlier thinkers to propound the sanctity of private landholdings:

> "But above all, a prince must refrain from taking property, for men forget the death of a father more quickly than the loss of their patrimony."

As the nineteenth century unfolded, political philosophers such as John Locke expanded on this theme, and regarded ownership of land as one of the principal aims of men. Ownership of land was dear to the American Founding Fathers, and the pursuit of property became fundamental in the settling of the North American west a few decades later.

Land as a Resource: Some Definitions

There is a distinction between land as a physical resource, and land as a productive or economic resource. Once this distinction is made, it becomes evident that land is far from being homogeneous or uniform, but varies according to time, space, and the means by which it is worked. In a strictly physical sense, land is far from being uniform in quality or simple in nature. Its value as a resource varies widely according to climate and location, as well as to intrinsic attributes of soil structure, mineral content, and inherent fertility.

As land itself is not a simple resource, so the definitions of land vary widely. The Report of the Interdepartmental Task Force on Land-Use Policy defined land as "the solid portion of the earth's surface and the natural resources related to it, such as vegetation, soils, and minerals" (Environment Canada, 1980). Economists vary from this definition in that they tend to emphasize the nature of land as capital:

> "Land in economics is taken to mean not simply that part of the earth's surface not covered by water, but also the 'free gifts of nature', such as minerals, soil fertility, etc. Land provides both space and specific resources." (G. Bannock et al., 1972).

The basic distinction here is land as a store of wealth, as a means to social progress and betterment.

Consideration of the use of land is equally open to more than one definition. The Alberta Land Use Forum emphasized land as:

> "...the base from which most of man's activities begin. It is the source of our food. It supplies space to build our houses and our factories, and the lumber to build them. It is the main source of our water supply. It supplies man with recreation, with wildlife, and with all the things of nature." (Alberta Land Use Form, 1976).

This concept of land as a resource to be used for the betterment of society pervades all analysis of land use, and is central to the present study.

Contrary to Will Rogers' dictum to "buy land, they ain't making it any more", it is not strictly a resource fixed in supply. Application of science and technology over the centuries has seen a series of productivity revolutions which have generally presaged much wider changes in terms of economic progress. The ability of individual farmers to produce more than they need for themselves and their families has made supplies of food and fibre available to sustain many more people engaged in other economic activities. To a lesser degree, similar advances in productivity by application of new methods have increased other land-based supplies of wood and minerals to feed the output of higher industrial endeavours. This concept of land as a dynamic resource is also central to this report, and recurs throughout.

Land and the Development of Canada

Much of the early penetration of Canada was predicated on land-based products, firstly furs, and later trees. The main waves of European settlement in the nineteenth century were also based on a bountiful endowment of land which could provide food for the world. Development of western agriculture was not always smooth and easy, but eventually the country came to be regarded as one of the breadbaskets of the world. As output expanded, many mistakes were made, not least of which saw large scale misery during the Dust Bowl of the 1930s. Lessons were taken from these mistakes, which have led to a level of agricultural research and innovation putting the country at the forefront of such endeavours. A northern climate is not the dread enemy it once was, given new strains of plants and methods of farming.

Canada's land also provides a large part of the world's supply of forest products, many minerals (including oil and natural gas), and the extensions of the land under the seas have provided immense supplies of protein in the form of fish. The country is regarded as fortunate indeed to accommodate all these activities and, furthermore, to provide a home for 25 million people.

This generalized image, of course, is simplified and conceals complex variations and a few ironies. This report deals with an investigation into one of these ironies, the under-utilization of land in Atlantic Canada by use of a case study, Kent County in New Brunswick. It is couched largely in terms of the changing use of land over various periods in the past few decades, mostly as this process of change involves agricultural land.

Objectives of the Study

Concern over abandonment of agricultural land in Eastern Canada is deeply rooted. The causes and consequences of this process are the objectives of this study. Specific goals can conveniently be expressed as four questions:

1. What were the major land-use trends in rural areas over the past two decades, and from which use to which use?
2. What other socioeconomic trends accompanied these changes?
3. What caused these changes to occur?
4. What are the implications of these changes for management and allocation of land resources for maximum contribution to the region and the nation in the medium term?

These specific goals begin to address a broader set of objectives. These can be summarized as:

- to document the extent, capability and current use of abandoned agricultural land;
- to analyse the physical as well as the socioeconomic causes and consequences of trends in the use of marginal lands;
- to examine the processes underlying the under-utilization or inappropriate use of marginal lands;
- to outline and analyse the policy and program responses of various government levels in the adjustment of the marginal use of agricultural land;
- to suggest the types of options to use marginal land more effectively.

Analyses will be from the perspectives of (1) the land owner or former farm operator; (2) the maintenance of the land resource itself; (3) the economy of the local region. All are in the context of the utilization of the land for the national good.

Background to the Study

As important as agricultural production is in Canada, both in terms of feeding the national population and providing an appreciable surplus for export, the proportion of the country actually cultivated or grazed is extremely small, about 5 per cent. In fact, only about 66 million hectares of land are actually counted as being under farms, or about 7 per cent of the total land area; about 46 million hectares are actually cleared and improved according to the 1981 Census of Agriculture. Much of the difficulty in farming in Canada has to do with a northern climate which inhibits crops and requires special measures during winter for rearing stock. Moreover, the land capable of cultivation is extremely limited. A little more than 4 million hectares, or 0.5 per cent of the Canadian land mass, is classified by the Canada Land Inventory as having no significant limitations for growing crops (CLI Capability Class 1). A further 4.5 per cent, or about 42 million hectares, have moderate, or moderately severe limitations to crop growth (CLI Classes 2 and 3). Not all of this higher capability land is cleared and farmed. (See Simpson-Lewis _et al_., 1979).

The relative scarcity of land capable of agricultural use puts definite limits on the industry's capacity to grow and expand. The present extent of improved land in Canada provides substantially for a population of about 25 million people; Britain's more limited land supply (about 13 million hectares) provides about 60 per cent of the food needs of its 55 million people (Edwards and Wibberley, 1971). Federal strategies for food production foresee an era of export-led growth for Canadian agriculture (Agriculture Canada, 1981a). In circumstances such as these, with domestic demand also growing, all available land resources take on importance.

Land is a dynamic resource in space and time. Much of this characteristic involves the margins of cultivation, and this concept needs more explanation. Experience of pushing forward the frontiers of agriculture is closely tied to the Canadian story, and in this respect the concept of "marginal production" is more easily understood than in other parts of the world. As the Prairies were settled, the "advancing frontier" of agriculture developed at a rapid pace. Even today, lands in the northern parts of Saskatchewan, Alberta, and British Columbia are being opened for agriculture.

There is a different perception of marginality in Eastern Canada where agricultural decline has been widespread during this century. Agricultural margins have retreated, although the quality of the land reserve is generally quite good. Work done by the Lands Directorate of Environment Canada has identified broad belts of agriculture across the country. Specifically, McCuaig and Manning (1982) have prepared a classification which sees intensity of land use diminish with distance from urban centre, a classification which draws heavily on the work of earlier economists and location theorists such as Ricardo and von Thünen. In the Canadian context, McCuaig and Manning have identified a series of four major area classes:

1. The _urban fringe_ occurs where urban land uses predominate. Returns deriving from urban land uses in this zone are generally higher than the use of that land for the agricultural enterprise for which it is best suited. This intensity of use is predicated on a relatively large population in a confined area engaged in a variety of economic activities usually in the secondary (manufacturing) and tertiary (service) sectors.

2. The _urban shadow_ is a zone of competition between urban and rural uses. Agriculture may occupy the land area, but may be displaced by urban uses depending on expansion, or expectation of expansion, of urban-dominated uses. This is a zone of fluctuation between the inner margins of rural uses and the outer margins of urban uses.

3. The _agricultural heartland_ is where agriculture is generally regarded as the most viable and predominating enterprise. Returns from agriculture generally exceed those from non-agricultural activities, and the type of agricultural enterprise,

given land of suitable quality, tends to be more intensive and higher value with output sold in the adjacent urban market. The land is subject to urban pressures to a lesser degree than the urban fringe, primarily related to demand for recreation in the countryside, and the infusion of urban values into the countryside.

4. The agricultural heartland is succeeded at varying distances from the urban centre by the agricultural margins, where the ability to earn a living from farming is roughly equal to the minimum acceptable standard in economic and quality-of-life terms. Beyond the agricultural margin, the land is usually covered by natural vegetative species, which, depending on economic circumstances, can form an agricultural reserve. If expectations rise, or if profits fall, the agricultural margin can retreat towards the urban centre and encroach on the outermost limits of the heartland. If farm income increases relative to expectations, the margin can advance away from the urban centre.

Applying a series of definitions based on trends in several censuses of agriculture (including value of farmland, and whether total area in farms and improved area has been increasing or decreasing) McCuaig and Manning have classified much of the Canadian ecumene in one or other of these classes (Figures 1.1 and 1.2). In particular, the heartland covers much of the southern part of the four western provinces interrupted only by a belt of retreating margins in the foothills of the Rocky Mountains in Alberta. In the eastern provinces, the heartland is more sporadic, and reaches an appreciable extent only in southern Ontario, around Montreal and into the closer Eastern Townships, in New Brunswick's Upper Saint John River Valley potato area, Prince Edward Island, and Central Nova Scotia.

Advancing agricultural margins are largely confined to a broad belt on the northern fringes of the prairies from Manitoba to Alberta, and in northerly areas of British Columbia, particularly the Peace River area. Retreating margins characterize a belt which extends eastwards from the eastern tip of Lake Superior through the Muskoka-Haliburton and Clay Belts of northern Ontario and western Quebec; covers the rest of southern Quebec particularly the Beauce, the northern shore of St. Lawrence River and the Gaspé; and encompasses most of New Brunswick, and the extremities of Nova Scotia.

Processes Underlying Dynamic Margins

It is evident that individual expectations play a key role in the movement of margins, and it will be seen later in this report that the experience of Eastern New Brunswick in this respect has been salutary. As the margin has retreated towards urban centres in much of Eastern Canada a process has occurred which is still imperfectly understood, but the results are plain to see in the form of unused fields and dilapidated farm buildings. Beattie, Bond and Manning have explained this with reference to Gunnar Myrdal's theory of circular and cumulative causation (Beattie, Bond and Manning, 1981; Myrdal, 1957). Although originally devised with reference to the experience of third-world countries, the theory comes uncomfortably close to explaining

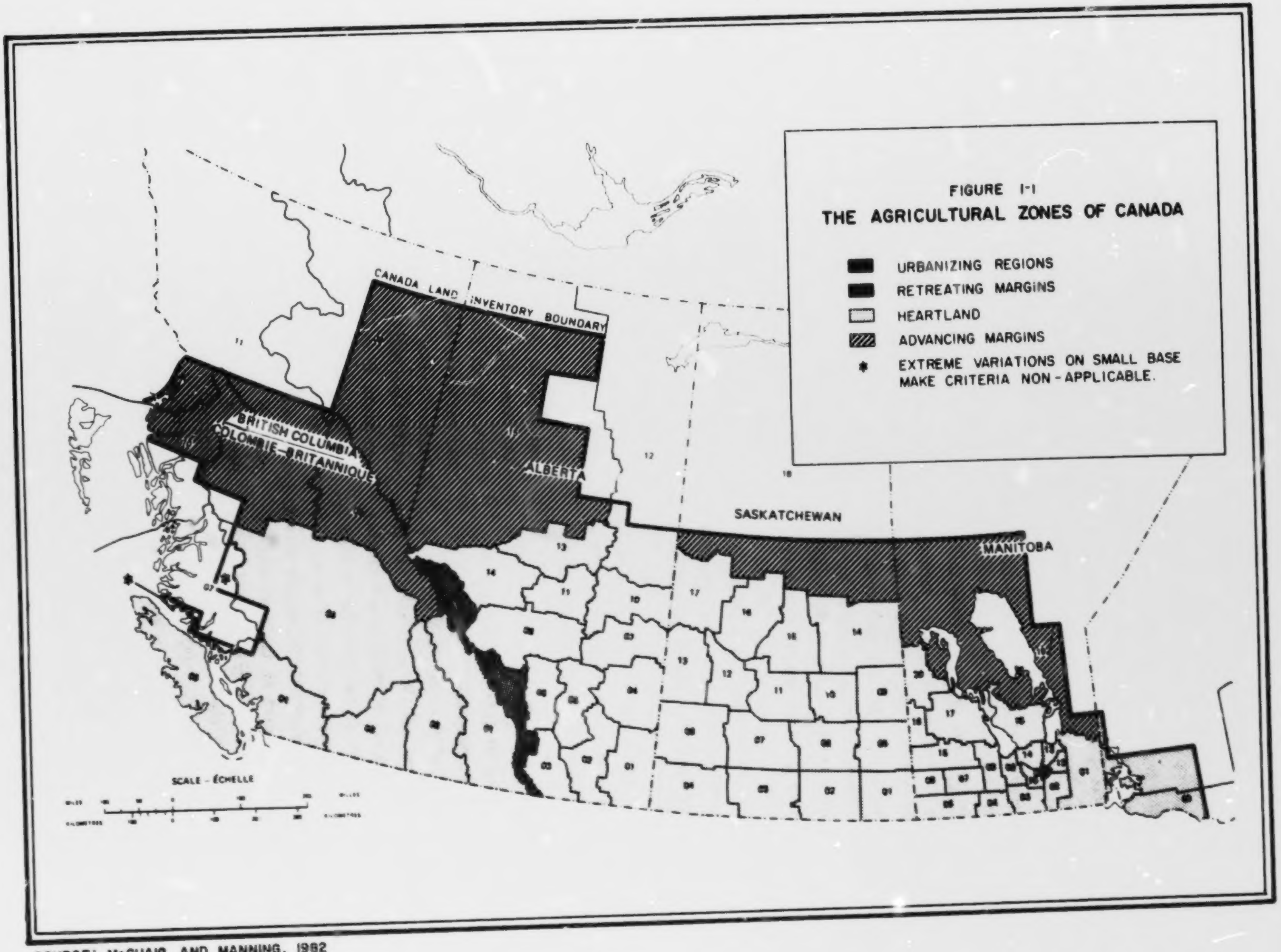

FIGURE I-1

THE AGRICULTURAL ZONES OF CANADA

URBANIZING REGIONS
RETREATING MARGINS
HEARTLAND
ADVANCING MARGINS
* EXTREME VARIATIONS ON SMALL BASE MAKE CRITERIA NON-APPLICABLE.
CANADA LAND INVENTORY BOUNDARY
BRITISH COLUMBIA
COLOMBIE-BRITANNIQUE
ALBERTA
SASKATCHEWAN
MANITOBA
SCALE - ÉCHELLE

SOURCE: McCUAIG AND MANNING, 1982

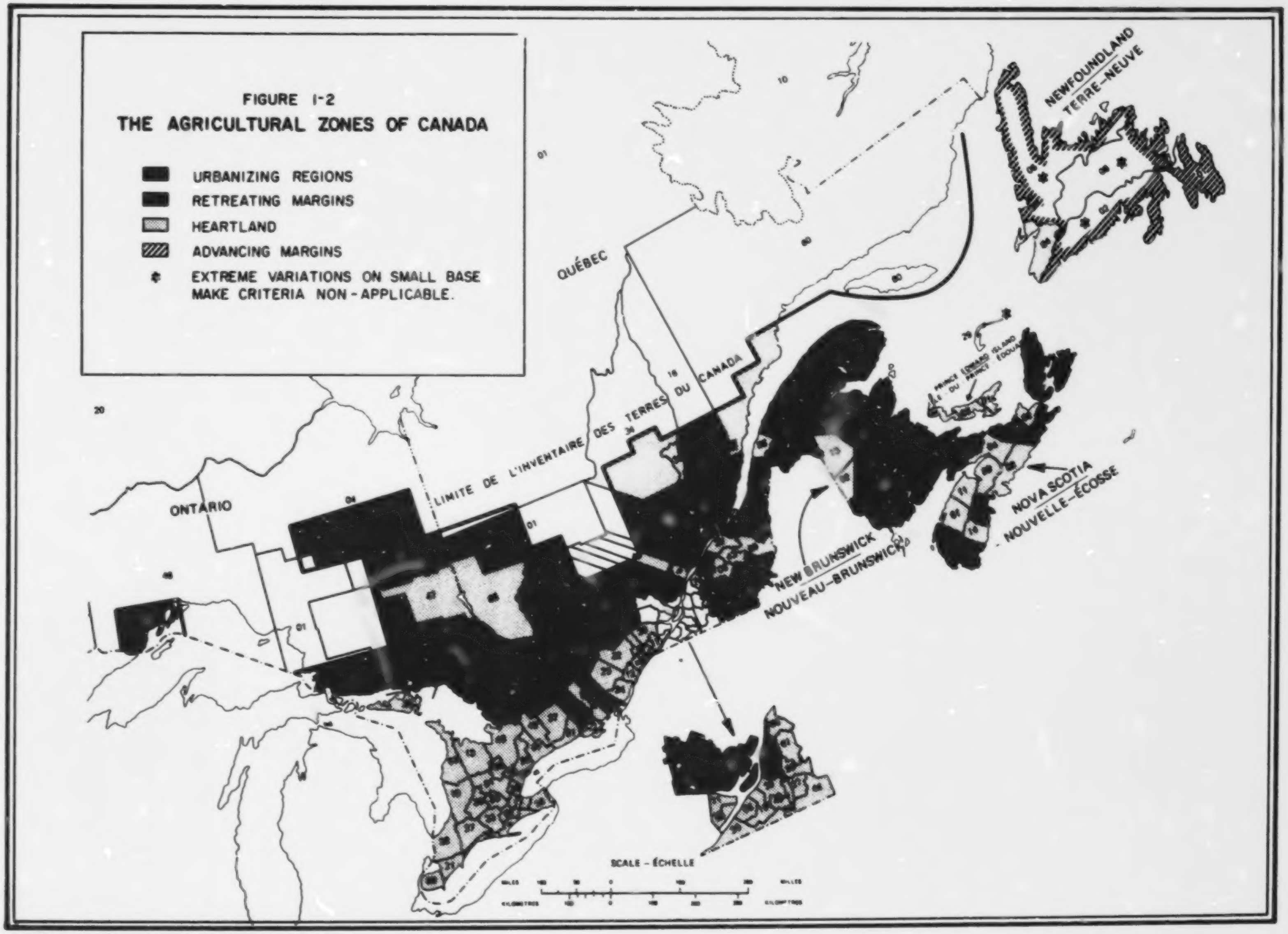

FIGURE I-2

THE AGRICULTURAL ZONES OF CANADA

URBANIZING REGIONS
RETREATING MARGINS
HEARTLAND
ADVANCING MARGINS
EXTREME VARIATIONS ON SMALL BASE MAKE CRITERIA NON-APPLICABLE.
ONTARIO
QUÉBEC
LIMITE DE L'INVENTAIRE DES TERRES DU CANADA
NEW BRUNSWICK
NOUVEAU-BRUNSWICK
NOVA SCOTIA
NOUVELLE-ÉCOSSE
PRINCE EDWARD ISLAND
ÎLE DU PRINCE ÉDOUARD
NEWFOUNDLAND
TERRE-NEUVE
SCALE - ÉCHELLE

SOURCE: McCUAIG AND MANNING, 1982

the process of declining rural areas throughout much of the Maritime provinces, and indeed, much of the agricultural area of the five eastern provinces outside Newfoundland.

In the framework of Myrdal's model, poorer regions are caught in a vicious circle of relative disadvantage with sufficient impetus to feed on itself after a time. Retreating margins, therefore, experience declining markets and emigration which in turn stimulate abandonment of cleared fields. This induces reductions in the level of infrastructure which had grown up ancillary to the local agricultural sector, which in turn stimulates further emigration, further loss of infrastructure, further land abandonment, and so on. The impetus of the process becomes such that it becomes very difficult to arrest, as abandoned fields become grown over with natural vegetative cover, thus necessitating large infusions of capital if the decision to clear and cultivate is taken again.

Marginality of the land resource must therefore be couched in terms of both physical and economic attributes. Although the "margins" of farmland can be defined and located with more or less precise definition at a given time as where cleared and improved areas (fields) meet the edges of contiguous areas of trees (or other natural vegetative cover), this margin or interface varies over time as dictated by the economic circumstances which surround the competitive capability of individual farm enterprises. We are not only considering the physical capabilities of the land, but also the capabilities of individual farms in commercial production. Put very simply, it isn't what a farmer can grow which counts, but what he can sell.

This very simple definition can be extended from the individual to the societal level by a process of aggregation. It can also be extended to include such factors as individual expectations and aspirations, varying levels of competition for land in a given area, historical and cultural patterns of settlement, and any number of other socioeconomic variables. All are reflected in the look of the land, its maintenance and sustenance as a societal resource, and its best use in the betterment of society's lot.

Layout of the Report

The balance of this chapter will outline the research methodology devised to investigate land resource opportunities, and more detail of the tools employed to apply this methodology to a given study area. Chapter Two introduces the different levels of the parts of Eastern Canada to be investigated, from the Atlantic Provinces, to three counties in Eastern New Brunswick, and finally to one of these counties, Kent. Some time is taken to explain the historical and agricultural context to the study in Kent County.

The next three chapters will contain the principal data findings, analysis, and synthesis of this data. Chapter Three will present findings from a detailed land-use survey of part of Kent County, which concentrated on the changing use of cleared land over a twenty year period up to the early 1980s. In this way, the extent and location of major land-use changes are identified.

Chapter Four will begin to investigate some of the factors which have influenced these changes in Eastern New Brunswick in terms of generally accepted economic, agricultural, and infrastructural frameworks, and the role played by government policies and programs. Chapter Five begins to put a human face on these changes by examining some of the options facing farmers in Eastern New Brunswick and the individual experiences of many of these farmers in facing up to a limited array of options.

Finally, Chapter Six presents conclusions from the project and in particular assesses the best use of the land base of Eastern New Brunswick in terms of the localized area, the Atlantic region, and Canada as a whole. A final evaluation will suggest directions for future government policies.

Research Methodology

The four questions outlined earlier (p. 3) are addressed in this project using an integrated research process. This systematic approach involves the analysis of land resource changes and trends, the evaluation of the socioeconomic and environmental implications of changes in land use, the assessment of future opportunities for improved land use and their implication for regional development.

The integrated research methodology includes four major components:

a) comparative land inventory analysis, involving time-series data which can be mapped and subjected to a variety of computerized overlay techniques to produce various mapping as well as land-use change and land capability tables;

b) correlation analysis, involving the relation of land-use trend data to socioeconomic and physical indicators to form hypotheses to explain the causes and consequences of land-use trends;

c) causal analysis, involving the use of surveys and a variety of interview techniques and statistical analyses to assess land-use decisions and evaluate the causes of land-use change;

d) impact evaluation, involving the use of empirical techniques to document and evaluate the consequences of resource use changes, in a variety of ways, and also to assess the opportunities for the improved allocation, use and management of a region's high capability land resource as a basis for stimulating regional development.

Within this methodological framework, a number of specific methods have been employed. The major components of data-gathering, analysis, and synthesis are summarized below. A more detailed description is provided in Appendix A.

Land-Use Survey

A survey of the present state of use of cleared land was undertaken involving two periods of aerial imagery. Base data were compiled over a detailed study area from vertical stereo imagery taken in 1963 at a scale of 1:15,840. This was compared to 1982 imagery in two main forms:

a) Some vertical stereo imagery at a scale of 1:10,000 became available during the project, and was used as it was issued;

b) The area was also flown in 1982 to record land uses on video tapes at a scale of circa 1:7,500, an innovative medium for interpretation.

A reconnaissance field check was also conducted to test interpretation of imagery. A land-use classification consisting of seven generalized classes was the basis of photo interpretation. These classes were defined as ranging from urban (developed) land uses, through intensive and extensive agriculture, to idle land and reverting or restocking fields. The residual, not coded specifically, is taken as non-agricultural, extensive use of land, mainly forestry (see Table 1.1). The emphasis in this classification on the use of cleared, formerly cleared, or developed land is intentional, and aims to trace the extent to which agricultural land has been converted to other uses, or has been abandoned to grow back into bushes and trees.

Interpreted land uses were compiled by hand on 1:10,000 orthophoto sheets using 1963 field lines, with necessary adjustments over the two decade period. Subsequent analysis of the compiled data involved digitization and entry to a computer system designed to plot a variety of final maps at different scales, and manipulate tabular information. Final maps from the project were plotted at three different scales:

a) at 1:10,000 for detailed reference work and for correlation to the original compiled data;

b) at 1:50,000, to permit easier analysis of the land use data; and

c) at 1:100,000 for incorporation in this report.

The maps from (a) and (b) above showed three different types of information in four colours:

i) land use in 1963;
ii) land use in 1982; and
iii) land-use change between 1963 and 1982.

The maps in (c) were simplified versions, in black and white only, showing:

i) location of agricultural land in 1963;
ii) location of agricultural land in 1982;
iii) location of land which changed from agricultural uses to idle or reverting, 1963-1982;
iv) location of land gained to agriculture, 1963-1982; and
v) location of land which changed from agricultural uses to urban or recreational uses, 1963-1982.

An assessment of the quality of cleared, formerly cleared, or developed land was also undertaken using data from recent (1982) soil surveys.

Background Information: Investigation of Census Data and Literature Review

To form a background to the study, census data were abstracted and recompiled at three different levels of analysis:

TABLE 1.1

LAND-USE CODING CLASSIFICATION

	CLASS	LAND USES INCLUDED
A	Intensive Agricultural Activity	Annual tillage, fruit/berry, tree plantations, farm site
B	Extensive Agricultural Activity	Hay and pasture, newly cleared
E	Inactive, could be brought back into cultivation fairly easily	Idle, still cleared, light restocking or reverting to bush and small trees.
I	Inactive, major effort to bring back into cultivation	Heavy restocking or reverting to trees
R	Urban development	Residential, commercial, urban core, transportation, institutional
P	Recreational Development	Recreation sub-division and site activities
	Other (not coded)	Woodland, logging and cutting trees, site forest activities, sand and gravel extraction, peat extraction, former extraction, former dwellings

a) Atlantic Canada: Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick.

b) Eastern New Brunswick: Gloucester, Northumberland, and Kent counties.

c) Kent County: although the detailed study area for other parts of the project dealt only with four parishes, or census sub-divisions within Kent County, census data at this level were not uniformly available because of confidentiality restrictions. The larger census division was therefore chosen as analytical proxy.

Information from the 1951, 1961, 1971, and 1981 censuses was used.

Landholder Interview Survey

To approach the complex issue of individual perceptions and aspirations regarding rural land-use change, a detailed questionnaire was administered to 27 landholders in eastern Kent County (see Appendix B for the questionnaire). This, it must be emphasized at the outset, was not a random sampling. Potential respondents were chosen from lists maintained by the New Brunswick Department of Agriculture and Rural Development. A variety of different types of holdings were identified ranging from different types of commercial farmers to retired farmers and part-time farmers. In this way, a broad spectrum of experiences, and factors which affected land-use decisions, were recorded.

The questionnaire solicited responses under five major headings:

a) property and land use;
b) land-use change and property management;
c) local services and local economy;
d) the future; and
e) respondent characteristics.

Interviews with Professionals

To complement the landholder interview survey, a less structured series of interviews was conducted with professional personnel who had wide experience of agricultural and other land-related conditions in eastern New Brunswick. This involved both historical perspectives and present views of the area's rural economy and outlook as it affected the land resource.

Initially, five main topics were identified to summarize the types of information required from this part of the project, and certain potential sources of information were also identified. These are summarized in matrix form in Table 1.2. The topics included scale of enterprise; farmer skills; markets for agricultural output and the marketing process; expectations of individuals; and completion for land. This list was modified as the project proceeded.

Potential sources of information from experienced personnel included provincial agricultural officials, including extension agents; marketing agencies; wholesalers; credit managers and real estate managers; federal officials; educational officials; municipal planning officials; industrial commissions; and representatives of farmers'

TABLE 1.2

INFORMATION MATRIX

POTENTIAL SOURCES

TOPICS	CENSUS	NEW BRUNSWICK AGRICULTURE	AGRICULTURAL REPRESENTATIVES	MARKETING AGENCIES	WHOLESALERS	CREDIT MANAGERS REAL ESTATE MANAGERS	FEDERAL AGENCIES: AGRICULTURE, DREE	AGRICULTURAL SCHOOLS	PLANNING COMMISSIONS AND OTHER MUNICIPAL OFFICIALS	INDUSTRIAL COMMISSIONS	FARMERS' GROUPS
SCALE	x	x	x				x				
SKILLS			x					x			x
MARKETING		x	x	x	x		x			x	x
EXPECTATIONS		x	x			x		x			x
COMPETITION FOR LAND		x			x	x	x		x	x	x

groups. It proved impossible to contact representatives of all these groups, but a good cross-section was interviewed. A list of those interviewed appears as part of Appendix A.

Program Impact Analysis

Major government programs, policies, or groupings of the same, were identified and reviewed with respect to their impact on land use in Eastern New Brunswick. Municipal, provincial, and federal programs were assessed in this way, partly through the landholder survey and interviews with professional personnel. Some of these programs have had significant effects on the direction and extent of land-use change over the 1960s and 1970s, but no more than a subjective judgment was possible at this time. Actual evaluations, where they exist, were traced and have been outlined.

Concluding Remarks

This integrated research methodology combines observation of physical features (by means of the land-use survey), with research of existing data sources (census and existing published research), and the soliciting of subjective judgments and personal experiences on the part of people actually involved with the land base of a given area or locale. The analysis of rural land use and socioeconomic change thus crosses a broad spectrum of research methods drawn from both social and physical sciences, to give a comprehensive view of land or other resource-related problems.

CHAPTER TWO

AGRICULTURAL TRENDS IN ATLANTIC CANADA

Historical and Social Background*

Agriculture has long taken second place to other economic activities in Atlantic Canada. This is ironic in the sense that successive waves of settlement from the 18th century onwards were encouraged on the basis of a more than adequate supply of land suitable for production of food and fibre. This rather unfortunate premise led to a hard and tenuous life for early settlers. Since 1950 or so, the Atlantic economy has seen a succession of relatively short-lived periods of prosperity followed by more prolonged periods of depression. During this time agriculture was consistently put forward as a solution to periods of unemployment associated with economic depression. Most expansion was based on extraction of a narrow resource base, mainly lumber and fish, for export to Europe. Each time a resource-based bout of expansion began, labour moved from agriculture to other endeavours. Later, labour left the area completely for work and more reliable incomes in secondary industries in Central Canada and New England.

Nevertheless, agriculture has a long tradition in the region. French settlers at Port Royal in 1605 raised corn, pumpkins, and beans, and shortly diversified to a variety of small grains and vegetables. An early attempt at settlement in Newfoundland in 1610 also included a farm, but it and other settlements failed after a few years. Some Acadians began farms along the Saint John Valley in 1693, and agriculture in Cape Breton and Prince Edward islands was officially encouraged after the establishment of Louisbourg in 1713. The serious promotion of Atlantic agriculture, however, had to wait until after influxes of Loyalist settlers in the 1780s.

The first European farmers faced a formidable array of disadvantages. Periodic resource booms (lumber and fish) would attract labour from the farms. There was a small dispersed population linked by poor roads. Most local capital was used to finance foreign trade. Farming practices were primitive. Above all, the land was rarely suitable for the cropping practices of the day. There was little scientific understanding of Atlantic soils which could have led to more suitable methods of cultivation.

Agriculture survived, however, and a measure of prosperity characterized the second half of the 19th century. Between 1851 and 1871 the area of cultivated land in the three Maritime Provinces went up from 733,000 hectares to 1.3 million hectares, with the biggest concentration in Nova Scotia. Production was principally of potatoes, cattle, sheep, and butter for export to growing markets in the United States and Upper Canada. Some produce also went to Britain, and the late 1800s saw the rise of the Annapolis Valley apple industry, mainly for export to Britain (Bircham, 1983; Hutten, 1981). Hay and turnips were also most valuable as export crops for fodder. Although more limited, there was also growth of agriculture in Newfoundland.

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*This historical discussion is based partly on Atlantic Development Board, 1969, and J.F. Booth *et al.*, 1967. Refer also to D.J. Trotman, 1982. Mimeo.

The late 19th century also witnessed Confederation (in 1867) and the birth of the National Policy (1879). This latter had three main aims: to assist urban industrial expansion (mainly in Central Canada) by means of the Canadian Tariff; to foster western settlement based on resource development; and to build an independent east-west transportation link. This was effectively the beginning of the end of any prosperity the Atlantic region had known, not only in terms of agriculture but also in terms of infant industrial endeavours.

The amount of land in farms in the Maritimes (no comparable data are available for Newfoundland, a Crown Colony until 1949) reached its peak, at 4.7 million hectares, in 1891, about the time of completion of the trans-continental railway. About 1.7 million hectares were cleared, and there were 113,278 farms recorded in the census of that year (Table 2.1). The decline in both the amount of land farmed and the number of farms since 1891 has been precipitous.

In 1891, the Maritimes contained 21 per cent of all Canadian farms and 15 per cent of its cleared land; by 1981 these proportions were 4 per cent and 1.2 per cent respectively. Part of this relative decline reflects the tremendous expansion of Prairie farmland between 1901 and 1931, but this cannot entirely mask the actual decline which has occurred in the Maritimes. This was most severe in Nova Scotia, followed by New Brunswick, then Prince Edward Island. Although it is the smallest province, in 1981 Prince Edward Island's cleared area exceeded those of its two larger neighbours. Only in certain areas, or for certain types of agricultural enterprise has there been reasonably consistent prosperity in the 20th century. Notable have been apples in the Annapolis Valley, potatoes in Prince Edward Island and the Upper Saint John River Valley, and dairying throughout the region, but particularly in Nova Scotia.

Despite this decline, appreciable numbers of people remained living on farms and engaged in agriculture (Figure 2.1). Not until after the Second World War did the farm population show signs of steep decline. This represented the second in a series of two movements of population from Maritime rural areas to towns and cities. The first essentially began during the First World War as demand for industrial workers in regional cities increased in response to the war effort. This had impetus to carry it into the post-war period until prolonged depression took over during the 1930s, and many people moved back to pick up the strands of their lives on the family farm.

A subsequent wave of emigration from the land began after the Second World War. A number of factors contributed. As in the First World War, demand for industrial workers increased to feed the war effort. As well, the young men who went overseas to fight came home with images of the world which made life on the Maritime farm seem somewhat circumscribed. Farming became more mechanized, and as the baby boom reached working age there were fewer and fewer farm jobs available.

Above all, however, the 20 years after the war saw a good deal of economic prosperity around North America. The lure of stable, high incomes in towns and cities in Ontario and New England proved too much for many young people

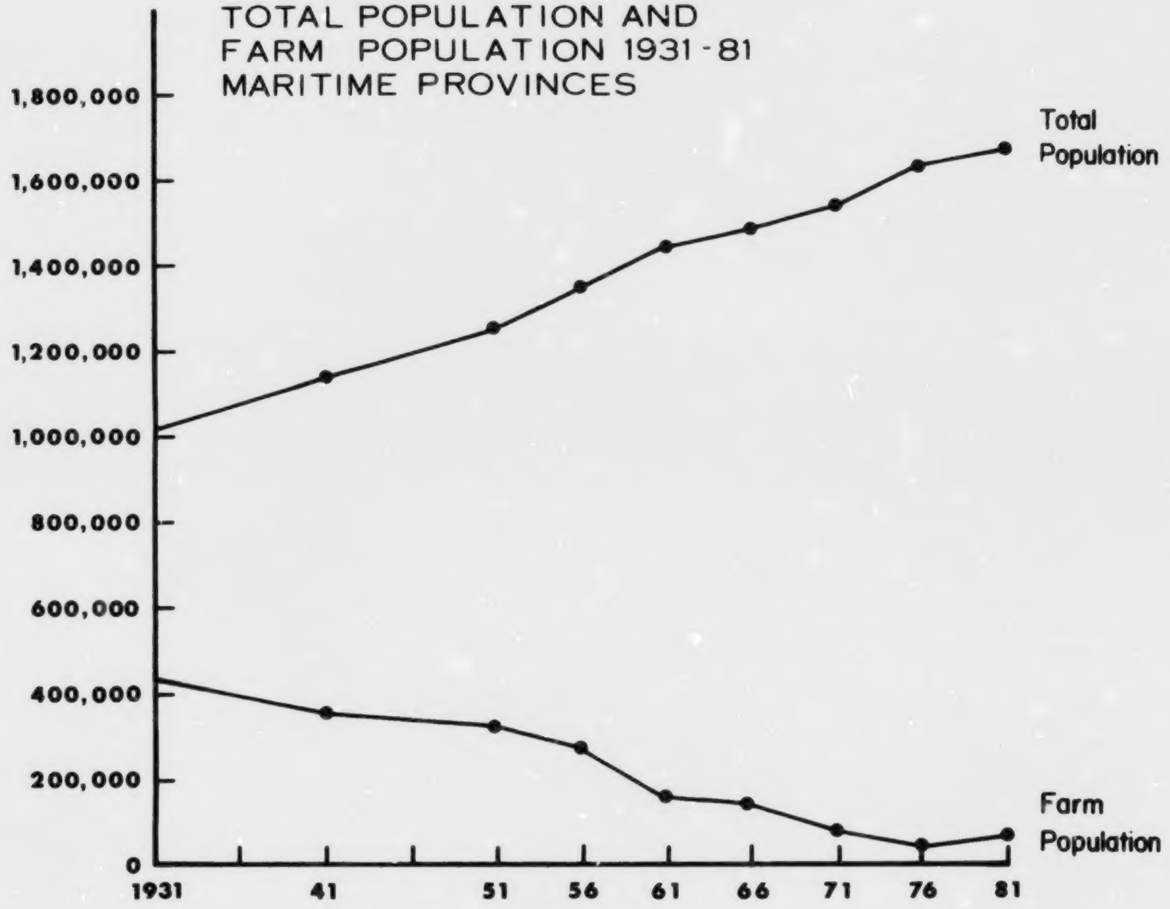
TABLE 2.1

NUMBER OF FARMS, TOTAL AREA IN FARMS AND IMPROVED AREA, MARITIME PROVINCES 1871-1981

	NUMBER OF FARMS	AREA IN FARMS	IMPROVED AREA IN FARMS
		-'000 ha-	-'000 ha-
1871	77,518	3,585	1,132
1881	106,339	4,182	1,510
1891	113,278	4,762	1,709
1901	105,232	4,338	1,374
1911	104,359	4,452	1,405
1921	97,788	4,132	1,266
1931	86,334	3,903	1,190
1941	77,096	3,622	1,127
1951	63,709	3,166	938
1961	33,391	2,204	741
1971	17,078	1,393	653
1981	12,941	1,187	573
per cent change peak year to 1981	-89	-75	-66

Source: 1961-1981, Statistics Canada, Censuses of Agriculture;
1891-1951, Urquhart, M.C. and Buckley, K.A.H. (Eds.), 1965.

FIGURE 2.1



Source: As per Table 2.1

facing an uncertain life on the farm. An earlier generation had also been faced with this option, during and after the First World War, but opportunities "away" in the 1950s and 1960s have proved to be much more solid and sustained, enabling emigrants to set down firm roots in distant places. This exodus reached its peak in the 1950s and 1960s, which were the years of most significant losses of farm population, farmland, and farms themselves in the Maritimes.

This drain has shown signs of levelling off in the 1970s, coincidentally as opportunities elsewhere have retreated in the face of persistent recession and high rates of inflation. The 1970s also saw a movement back to the land mostly for living space while occupants still maintained urban jobs, but with a sprinkling of bona fide farmers wishing to try their hand at working the land.

This last point indicates a Maritime, if not a broader Canadian, trait: attachment to the land. The area is still one of the least urbanized in Canada; in 1981, some 30 per cent of the total regional population was classified by the census as rural, as against less than a quarter nationwide. A long experience with economic uncertainty has given Maritime society a healthy respect for keeping one foot on the land against the threat of hard times. A significant part of the increase of farm population from 1976 to 1981 could be accounted for by part-time and hobby farmers who may be at various stages of leaving urban occupations and moving back to farming for a living.

Maritime agriculture has made strides since 1945. Although there are fewer farms, those which have survived are bigger, more mechanized, and more specialized. The region is still much less than self-reliant for many agricultural commodities which can be produced locally. Local supply meets local demand for fluid milk, some fruits, potatoes, and eggs. Although output of other commodities, especially pork, increased substantially over the past 10 or 15 years there is still a deficit which must be filled by imports. This lack of self-reliance persists stubbornly in spite of a series of federal government programs designed to influence the course of the rural economies in the Maritimes, and which have included the Agricultural and Rural Development Administration (ARDA), the Fund for Rural Economic Development (FRED), the Prince Edward Island Comprehensive Development Plan, and various Agriculture Development Sub-Agreements.

Subsequent sections of this chapter will examine the region's agriculture in the second part of the 20th century in more detail.

The Agricultural Land Resource in Atlantic Canada

Work by J.L. Nowland (1975) puts the reserve of land suitable for general arable use in Atlantic Canada (Canada Land Inventory Classes 2, 3, and 4) at 5.7 million hectares (Table 2.2). The biggest share of this reserve is in New Brunswick (3.5 million hectares) followed by Nova Scotia (1.7 million hectares) and Prince Edward Island (462,000 hectares). As not all of this land occurs in sufficiently large, contiguous blocks, the realistic land base for agriculture amounts to 2.6 million hectares, and about 734,000 hectares of this area were, as of 1971, in CLI Classes 2, 3,

TABLE 2.2

CLEARED AND POTENTIAL AGRICULTURAL LAND AND AGRICULTURAL BLOCKS IN ATLANTIC CANADA

	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Atlantic Provinces
		- Thousands of hectares -			
Agricultural Soils (Classes 2-4)	68	462	1,681	3,525	5,736
Area in Agricultural Blocks	36	370	1,150	1,499	3,055
Classes 2-4 in Agricultural Blocks	36	336	986	1,304	2,662
Cleared Classes 2-4 in Agricultural Blocks	8	218	238	270	734
Cleared Classes 2-3 in Agricultural Blocks	4	214	219	201	639

Source: J.L. Nowland, 1975. Based in part on work by J.D. Hilchey for Nova Scotia and K.K. Langmaid for New Brunswick.

Note: Totals may not add exactly due to conversion and rounding.

and 4 and already cleared. This leaves an untapped reserve of 1.9 million hectares which is mainly under forest.

Since this analysis by Nowland was completed, the area of cleared and improved land in Atlantic Canada has continued to decline (1971-1981) and, in corresponding fashion, the unused reserve of agricultural land has risen. The 1981 Census identified about 1.2 million hectares of land in farms in Atlantic Canada, of which about 573,000 hectares were cleared and improved. Not all land included in the census cleared area, however, will be in capability classes 2, 3 and 4.

Atlantic area soils have certain, rather restrictive limitations. Notable among these are low fertility, undesirable soil structure and/or low permeability, excessive stoniness, excess water, and steep topography. Any one, or any combination of these and other factors, affect almost all soils in the region. These limitations mean capital expenditures for correction or improvement. For example, low fertility in a class 2 soil would require that up to half the land's value be spent on fertilizer and lime to approach an acceptable level of productivity (Nowland, 1975, 5-6).

The region's climate is also a general limiting factor to good soil productivity. Only in the Annapolis Valley, parts of Prince Edward Island, and small areas of coastal Eastern New Brunswick are accumulated degree-days above 5°C sufficiently high to allow reliable growth of crops such as corn (Nowland, 1975, 7; Simpson-Lewis *et al.*, 1979, especially 8-9).

Socioeconomic Trends in Atlantic Agriculture

Area of Land in Census Farms 1951-1981*. We have already briefly examined trends in the total area of land in census farms since 1951. Total area has declined by more than 60 per cent, accompanied by an 80 per cent decline in the number of farms. The decline in the area of improved land between 1951 and 1981, however, was not as steep, in the order of 38 per cent. This was paralleled almost exactly by the decline in total cropped area, and the corollary is that area under woods in census farms went down proportionately further.

In fact, this last decline was by more than 70 per cent (Table 2.3). Although there was much less land in farms in Atlantic Canada in 1981 than in 1951, the land which remained was used more intensively. Improved area represented

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*Census data in this and other sections of this report are derived from national and provincial summary volumes of the Census of Agriculture published by Statistics Canada. Specific volumes are:

	Canada (includes national and provincial data)	New Brunswick (includes county data)
1951	Volume VI, Part I	Volume VI, Part I
1961	Catalogue 96-530	Catalogue 96-534
1971	Catalogue 96-701	Catalogue 96-705
1981	Catalogue 96-901	Catalogue 96-905

Other census data are derived from Census of Populations, General Characteristics for each of the four years. All are referred to in tables or diagrams in this report as "Census of Agriculture" or "Census of Population".

TABLE 2.3

BASIC AREA STATISTICS AND NUMBER OF FARMS, ATLANTIC CANADA 1951-1981

	1951	1961	1971	1981	% Change 1951-1981
Total land (ha)	------------------- 50,171,000 ------------------				
Total land in farms (ha)	3,166,482	2,203,506	1,418,612	1,220,389	-61.5
as % of total land area	6.3	4.4	2.8	2.4	
Total improved area (ha)	948,264	741,265	561,189	583,053	-38.5
as % of farm area	29.9	33.6	39.6	47.8	
Total cropped area (ha)	661,922	491,991	374,505	406,332	-38.6
as % of improved area	69.8	68.4	66.7	69.7	
Woodland in farms (ha)	1,729,419	1,177,795	665,660	512,565	-70.4
as % of farm area	54.6	53.4	46.9	42.0	
Average farm size (ha)	50	66	83	94	+88.0
Average area/ farm (ha)	15	22	33	45	+300.0
Cropped area/ farm (ha)	10	15	22	31	+310.0
Woodland area/ farm (ha)	27	35	39	40	+48.2

Source: Census of Agriculture

almost 48 per cent of total area in 1981 against 30 per cent in 1951, although cropland as a proportion of this improved area remained at an almost constant 66-70 per cent over the period. Improved cropping practices, however, increased yields and total output from this area quite dramatically over the three decades.

Average farm size increased from 50 to 94 hectares between 1951 and 1971, and the portion of this which was improved went from 30 per cent in 1951 to 48 per cent over the 30 years. This is consistent with the more intense use of land in 1981 than in 1951. In general, the portion of farms with larger areas of improved land has increased since 1951, but much more than half had below 53 hectares in 1981, with a solid 15 per cent less than 4 hectares (Table 2.4). The smallest area classes may reflect the higher incidence of occasional sales of agricultural produce from part-time or hobby farms, sales which are, nevertheless, sufficiently high to classify the farm as a census farm. More than a quarter of all farms had an improved area of more than 53 hectares in 1981, a substantial increase from the 2.6 per cent in 1951.

Economic Class of Farms. Because of changes in definition from census to census, and inflation between census years, comparison of economic class of farm from 1951 to 1981 should be treated with some caution.* There has been a big improvement in the proportion of farms in the topmost economic classes as defined by the census (Table 2.5); less than 1 per cent were in these classes in 1951, more than 1 in 5 were in these classes in 1981. Equally, there are still substantial proportions of all farms at the other end of the scale, in operations ranging from part-time to small scale. In earlier years, these probably reflected more subsistence or, at best, semi-commercial enterprises. In 1981 in particular this would reflect more production from farms run by farmers who, at least for part of the year, derive an income from other sources. Seasonal patterns of moving from occupation to occupation, which still survive in Atlantic agriculture to a significant degree, also explain part of this distribution.

Capital Value. The general trend of bigger, if fewer, farms is also reflected in data for the capital values in Atlantic Canada (expressed in constant 1951 dollars). Total capital value for all farms went up by 19 per cent, while on a per farm basis the increase was by almost six times (Table 2.6). The distribution of this capital between different components of farm enterprises reveals fairly small changes in capital mix. The value of land and buildings went up from 61 per cent of total value to 69 per cent, not really surprising over a period of time when demand for land for many uses, including as a hedge against inflation, increased markedly. The value of machinery and equipment went up marginally as a proportion of total capital values per farm (from 16 to 19 percent), again not entirely unexpected during a time of less available labour, and correspondingly, more machines capable of doing the work. The value

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*In 1951, the census defined a commercial farm as having sales of agricultural products in excess of $250. In terms of 1981 prices (inflated by the Farm Input Price Index for Eastern Canada) this is equivalent to almost $1,200.

TABLE 2.4

FARMS CLASSIFIED BY IMPROVED AREA PER FARM

ATLANTIC CANADA 1951-1981

	1951	1961	1971	1981
			- Per cent -	
Area Improved (ha)				
Less than 1.2	3.1	5.0	8.1	6.9
1.2 to 3.9	19.6	10.3	7.9	8.1
4 to 27.9	62.0	56.1	42.4	36.6
28 to 52.9	12.5	20.8	23.2	20.7
53 to 72.9	1.9	4.5	8.5	9.6
73 to 96.9	0.5	2.0	4.5	6.9
97 to 161.9	0.2	0.9	4.0	7.3
162 and over	0.2	0.4	1.4	3.9
TOTAL	100.0	100.0	100.0	100.0

Source: Census of Agriculture

TABLE 2.5

ECONOMIC CLASS OF FARMS, ATLANTIC CANADA 1951-1981

	1951	1961	1971	1981
			- Per cent -	
Commercial (1)	0.9	4.9	7.9	20.2
Semi-Commercial (2)	46.6	40.4	40.7	48.4
Small Scale/Part-Time (3)	52.5	54.7	51.4	31.4
TOTAL	100.0	100.0	100.0	100.0

Source: Census of Agriculture

Note: (1) Commercial farms had sales of agricultural products of $10,000 or more in 1951 and 1961, more than $25,000 in 1971, and more than $50,000 in 1981. (2) Semi-commercial farms had sales of agricultural products of between $250 and $9,999 in 1951 and 1961, between $2,500 and $24,999 in 1971, and between $2,500 and $49,999 in 1981. (3) Small scale or part-time farms had sales of less than $250 in 1951 and 1961, and less than $2,500 in 1971 and 1981.

TABLE 2.6

CAPITAL VALUES OF FARMS, ATLANTIC CANADA 1951-1981

	1951	1961	1971	1981	% Change 1951-1981
Land and Buildings ($000)	255,704	207,858	222,433	343,376	+34.3
Value/Farm ($)	4,014	6,225	13,024	26,534	+661
% of Total Farm Value	61.3	61.0	63.7	69.2	
Machinery and Equipment ($000)	66,873	76,003	74,948	94,568	+41.4
Value/Farm ($)	1,050	2,276	4,389	7,308	+696
% of Total Farm Value	16.2	22.3	21.5	19.0	
Livestock and Poultry ($000)	91,476	56,807	51,972	58,478	-36.1
Value/Farm ($)	1,436	1,701	3,043	4,519	+315
% of Total Farm Value	21.9	16.7	14.9	11.8	
Total Capital Value ($000)	417,053	340,067	349,353	496,422	+19.0
Value/Farm ($)	6,499	10,202	20,456	38,360	+590
% of Total Farm Value	100.0	100.0	100.0	100.0	

Source: Census of Agriculture

Note: All dollar figures expressed in constant 1951 figures deflated by the Farm Input Price Index for Eastern Canada.

of livestock and poultry went down quite substantially from 1951 to 1981, reflecting at least in part the replacement of horses by machines, and in part probably due to the coincidence of census years with cyclical fluctuations of livestock prices. There were also considerably fewer animals on farms in 1981 than in 1951, although the value of individual animals may have been much higher.

Machinery on Farms. Increases in capital values generally are closely correlated to increased mechanization of farms, and Atlantic farmers have bought much more equipment since 1951. In all cases except automobiles, absolute numbers of certain pieces of equipment have increased in spite of much fewer working farms to accommodate them, and even for automobiles, 72 per cent of census farms reported a car in 1981 against less than 30 per cent in 1951 (Table 2.7). This probably reflects less an addition of capital to the enterprise than less willingness from farm families to be denied access to modern twentieth century amenities, usually urban in nature.

Other pieces of equipment are more integral to running a farm operation. The number of tractors increased by 70 per cent over the 30 years, representing a virtual doubling of tractors per farm. This trend has been matched by an equal decline in numbers of horses on farms, although many were still kept in 1981 either for pleasure, or for breeding. Other accepted pieces of machinery since 1951 have been such items as combine harvesters, balers, and forage harvesters. Increased numbers of all three represent a mixture of the availability of these kinds of technology, the ability to buy them, severely reduced supplies of farm labour, and a willingness to spend money to reach more efficient scales of operation. Certainly, technological innovation has been important, for example as new machines for harvesting have replaced older machines such as binders, threshers, and mowing machines.

Livestock on Farms. Examination of trends in numbers of major livestock on census farms in Atlantic Canada reveals increasing specialization and scale of operation between 1951 and 1981. To a large extent, this represents the elimination of, or conversion from, small-scale semi-subsistence operators to relatively large, capital-intensive commercial farms. The old regime held sway to a considerable extent at least to 1961 with a pattern of small, mixed farms with small numbers of several types of livestock. More than 50 per cent of all farms reported numbers of all livestock (except sheep) in 1951, and to a considerable extent this would represent the means by which the farm-family was fed and, to a degree, clothed. Any surplus would be traded in localized markets. Horses would usually be present (reported from 71 per cent of all farms in 1951) to provide motive power (Table 2.8). As mentioned in the previous section, the total number of horses has declined steeply to 1981, when a little over one in five farms reported them, although the numbers of horses per farm has actually increased as they have become largely recreational stock.

A large number of farms in 1981 still reported cattle (including milk cows) for an average of almost 70 animals per farm. There are only a few large-scale feedlots in Atlantic Canada, and beef rearing has become a favourite

TABLE 2.7

MACHINERY ON FARMS, ATLANTIC CANADA 1951-1981 (1)

	1951	1961	1971	1981	% Change 1951-1981
Automobiles	19,301	18,526	13,226	12,966	
% of all farms	29.4	51.6	65.4	72.0	-32.8
Average number per farm	1.03	1.08	1.20	1.40	
Trucks	12,659	14,590	12,136	13,773	
% of all farms	18.7	39.3	55.8	68.7	-8.8
Average number per farm	1.06	1.11	1.30	1.50	
Tractors	12,430	21,351	19,616	21,077	
% of all farms	18.7	55.3	77.2	85.0	+69.6
Average number per farm	1.04	1.20	1.50	1.90	
Grain Combines	245	1,570	2,443	2,232	
% of all farms	0.4	4.7	13.9	16.6	+911.0
Average number per farm	1.0	1.0	1.03	1.04	
Balers	---	4,081	6,744	6,983	
% of all farms	---	12.1	39.1	51.8	+71.1 (2)
Average number per farm	---	1.00	1.00	1.04	
Forage harvesters	---	396	655	1,238	
% of all farms	---	1.1	3.5	8.9	+313.0 (2)
Average number per farm	---	1.05	1.00	1.07	

Source: Census of Agriculture

Notes: (1) Average number of pieces of equipment per farm derived using the number of farms actually reporting equipment, not all farms.

(2) Change 1961-1981

TABLE 2.8

LIVESTOCK ON FARMS, ATLANTIC CANADA, 1951-1981

	1951	1961	1971	1981	% Change 1951-1981
Horses	81,217	27,253	11,342	8,926	-89.0
% of all farms	70.7	52.2	33.2	21.8	
Horses/farm	1.8	1.6	2.0	3.2	+77.8
All Cattle	433,967	452,228	356,806	360,568	-16.9
% of all farms	80.3	84.2	75.5	68.1	
Cattle/farm	8.5	16.1	27.7	40.9	+481.2
Milk Cows	261,319	173,702	108,257	91,053	-65.2
% of all farms	77.7	76.7	52.1	30.1	
Cows/farm	5.3	6.8	12.2	22.8	+430.2
Pigs	200,820	150,409	251,670	364,833	+81.7
% of all farms	54.0	38.6	30.5	21.2	
Pigs/farm	5.8	11.7	48.2	133.2	+2,296.5
Sheep	202,524	157,796	70,961	71,357	-64.8
% of all farms	17.0	17.0	9.1	7.9	
Sheep/farm	18.6	27.7	45.5	69.5	+373.6
Hens & Chickens	3,912,603	3,961,919	5,895,356	6,831,475	+74.6
% of all farms	66.9	54.2	27.2	25.2	
Hens/farm	91.8	219.1	1,267.5	2,098.1	+288.5

Source: Census of Agriculture

Note: Average number of animals per farm derived using the number of farms actually reporting livestock and poultry, not the total number of farms.

occupation of weekend and part-time farms as relatively little work is required compared to other types of enterprises. Most small-scale beef production is destined for the "freezer" trade in strictly limited markets, with a fairly typical pattern being a landholder running a few animals, sometimes on behalf of other family members or friends, on a few cleared acres. Commercial marketings of cattle from the Maritimes have represented a fairly stable proportion of national marketings since the mid-1960s, about 1.2 or 1.3 per cent. The actual number of animals this represents has varied from about 31,000 to more than 56,000, and a significant proportion of these would be dairy-herd culls.

The regional dairy herd has dropped quite steeply as dairy operations have become some of the most efficient in agriculture. Production per cow has increased dramatically (from about 1.7 kilolitres in 1951 to more than 4 kilolitres in 1981) and strict controls on supply by means of a quota system have naturally meant a drop in herd size.

An increase in regional pig numbers has been prompted by the goal of more regional self-reliance in pork, and has been helped by the availability of western feed grains brought into Atlantic Canada at subsidized freight rates. The six or so animals per farm in 1951 probably represented food for the farm family; the 133 animals per farm in 1981 represented a series of highly capitalized feed operations. The number of hog marketings in the region as a proportion of national marketings has increased since the early 1960s, although substantial gains in the late 1960s were not maintained. Regional marketings represented about 2.7 per cent of the Canadian total in 1964, and 3.3 per cent in 1980. These figures represented 197,000 and 440,000 hogs respectively.

Field Crops. Most outside observers are surprised at the variety of field crops which can be grown in Atlantic Canada. Main production is in the Maritime provinces with particular regional emphases. Census statistics since 1951 once again indicate the move away from a system of small mixed farms growing hay and grain for on-farm use or for localized sales, to appreciably more specialization. There has also been adoption of new strains of crops, suited to local conditions, and which have largely displaced more traditional, lower energy crops. An example is the increased area under wheat, barley, and corn partly at the expense of oats, mixed grain, buckwheat, and hay (Table 2.9). In all cases, however, area per farm under field crops increased. Yields have also increased quite dramatically since 1951 for all field crops as new cropping practices have been adopted, and new strains of plants developed (Table 2.10). Usually these yield increases have matched or exceeded gains in the national average.

Specialization has particularly affected potatoes and tobacco production. The area of potatoes per farm went up from less than 1 hectare in 1951 to almost 24 hectares in 1981. Over the same period, the number of farms growing potatoes declined from almost four out of five to about one in six. Main areas of specialization are in Prince Edward Island and parts of New Brunswick.

The most important grain growing areas are in Prince Edward Island, more so than in either New Brunswick or Nova Scotia. Imports of

TABLE 2.9

FIELD CROPS, ATLANTIC CANADA 1951-1981

	1951	1961	1971	1981	% Change 1951-1981
Wheat (ha)	3,773	3,214	6,382	9,679	+256.6
% of all farms	4.5	4.3	5.9	6.3	
Area/farm (ha)	1.3	2.2	6.3	11.3	+907.7
Oats for Grain (ha)	136,433	96,864	48,298	35,007	-74.3
% of all farms	52.7	50.8	35.2	25.9	
Area/farm (ha)	4.1	5.7	8.0	10.8	+263.4
Barley (ha)	8,942	2,221	19,612	28,933	+323.6
% of all farms	8.9	3.1	10.8	10.9	
Area/farm (ha)	1.6	2.1	10.1	20.6	+1,287.5
Mixed Grains (ha)	35,322	27,196	35,954	38,400	+8.7
% of all farms	10.2	11.4	16.6	14.7	
Area/farm (ha)	5.5	7.2	12.7	20.1	+365.4
Buckwheat (ha)	3,632	1,490	822	1,185	-67.4
% of all farms	4.4	2.5	1.3	2.0	
Area/farm (ha)	1.3	1.8	3.6	4.6	+353.8
Tame Hay (ha)	406,709	286,626	182,483	193,623	-52.4
% of all farms	92.4	82.6	67.3	67.4	
Area/farm (ha)	6.9	10.4	15.9	22.2	+321.7
Corn-silage, fodder (ha)	842	1,654	5,984	7,293	+866.1
% of all farms	n/a	3.7	5.4	6.4	
Area/farm (ha)	n/a	1.3	6.4	8.8	+676.9
Potatoes (ha)	33,010	44,699	44,863	49,651	+50.1
% of all farms	78.7	71.2	21.6	16.2	
Area/farm (ha)	0.7	1.9	12.2	23.6	+3,371.4
Tobacco (ha)	0.0	76	1,969	2,067	+2,719.7
% of all farms	0.0	0.1	7.8	6.5	
Area/farm (ha)	0.0	2.0	14.7	24.6	+1,230.0

Source: Census of Agriculture

Note: Area of field crops per farm derived using the number of farms actually reporting field crops, not the total number of farms.

TABLE 2.10

YIELDS FROM FIELD CROPS 1951-1981 ATLANTIC PROVINCES (1) AND CANADA (2)

	1951		1961		1971		1981		% Change 1951-1981	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
					- Bushels per acre -					
Wheat	23.2	21.9	27.2	11.2(c)	36.8	27.3	42.0	29.8	+80	+36
Oats for Grain	39.2	41.5	42.6	33.2(c)	46.1	53.2	55.6	53.4	+42	-29
Barley	33.8	31.3	34.7	20.4(c)	38.5	43.0	50.8	46.1	+50	-47
Mixed Grain	41.7	45.6	47.2	39.2(c)	46.8	52.1	56.8	53.2	+36	+17
Potatoes (a)	132.7	105.0	173.6	144.3	217.5	181.8	244.3	210.8	+84	+100
Tame Hay (b)	1.9	1.9	2.0	1.7	2.1	2.0	2.2	2.2	+16	+16

Source: Agriculture Canada, 1980, 1982b.

Notes:
- (a) Hundred-weights per acre.
- (b) Tons per acre.
- (c) These exceptionally low figures for yields were mainly due to severe drought in the Prairie Provinces in 1961, which affected the national average yield.

western feed grains at subsidized freight rates under the Feed Freight Rates Act have inhibited expansion of Maritime feed grain production quite severely (Robinson, 1983).

Fruits and Vegetables. Given fairly small areas per farm in Atlantic Canada, one means to increase returns is to use a unit of land more intensively, and fruit and vegetable crops represent a series of relatively high value alternatives to achieve this end. Different patterns emerge in the adoption of this option, however, between the three major groups (Table 2.11). Tree fruits, especially apples, have for long been a mainstay of Nova Scotia production, and skills and experience have accumulated around this highly specialized enterprise. In this respect, individual operators have become fewer and larger as the total area in fruit production has gone down.

For small fruits (principally strawberries, raspberries, and blueberries) development as cash crops is much more recent, and perhaps represents one of the few real success stories in diversifying Atlantic agriculture since the Second World War. Strawberries and raspberries have developed to cater to local markets, particularly the U-pick trade; blueberries have become a successful export crop, especially from Nova Scotia, but with appreciable production from all four provinces. Specialized vegetable production is also a recent development to meet local demand for fresh produce, and also for freezing at one of the area's several plants. Given more processing facilities, more vegetables could be grown.

Age of Farm Operator. One unavoidable consequence of overall, widespread agricultural decline in Atlantic Canada since 1951 has been significant proportions of operators in higher age groups, 45 years and older (Figure 2.2). Rural depopulation took the youngest people away first, leaving a sadly depleted human resource on which to draw for agricultural growth. This is most evident in the ages up to 35 years old, which showed progressive decline up to 1971; only in the 1970s have prime-aged farmers begun to increase their presence. Conversely, farmers 70 years old and over still formed a significant proportion of operators (around 10 per cent) up to 1961 but have declined since then. As a general statement, it is likely that many farms which went out of production in the 1960s and 1970s were run by these older people, and abandonment occurred with retirement or death. As more young people have emerged with a willingness to forego the amenities of urban living, and usually with advanced, post-secondary agricultural training, a healthy trend towards a more balanced age structure among farm operators has emerged.

Summary: Post-War Agricultural Trends in Atlantic Canada

An overall picture of widespread, often severe, decline in Atlantic agriculture since 1951 is balanced to some extent by the emergence of a smaller number of capital-intensive, specialized farms. These survivors of the worst period of decline (the two decades between 1951 and 1971) now form the hope for the region's agricultural future. The process of reducing the sector to this hard core, however, has entailed substantial

TABLE 2.11

VEGETABLES AND FRUITS ON FARMS, ATLANTIC CANADA 1951-1981

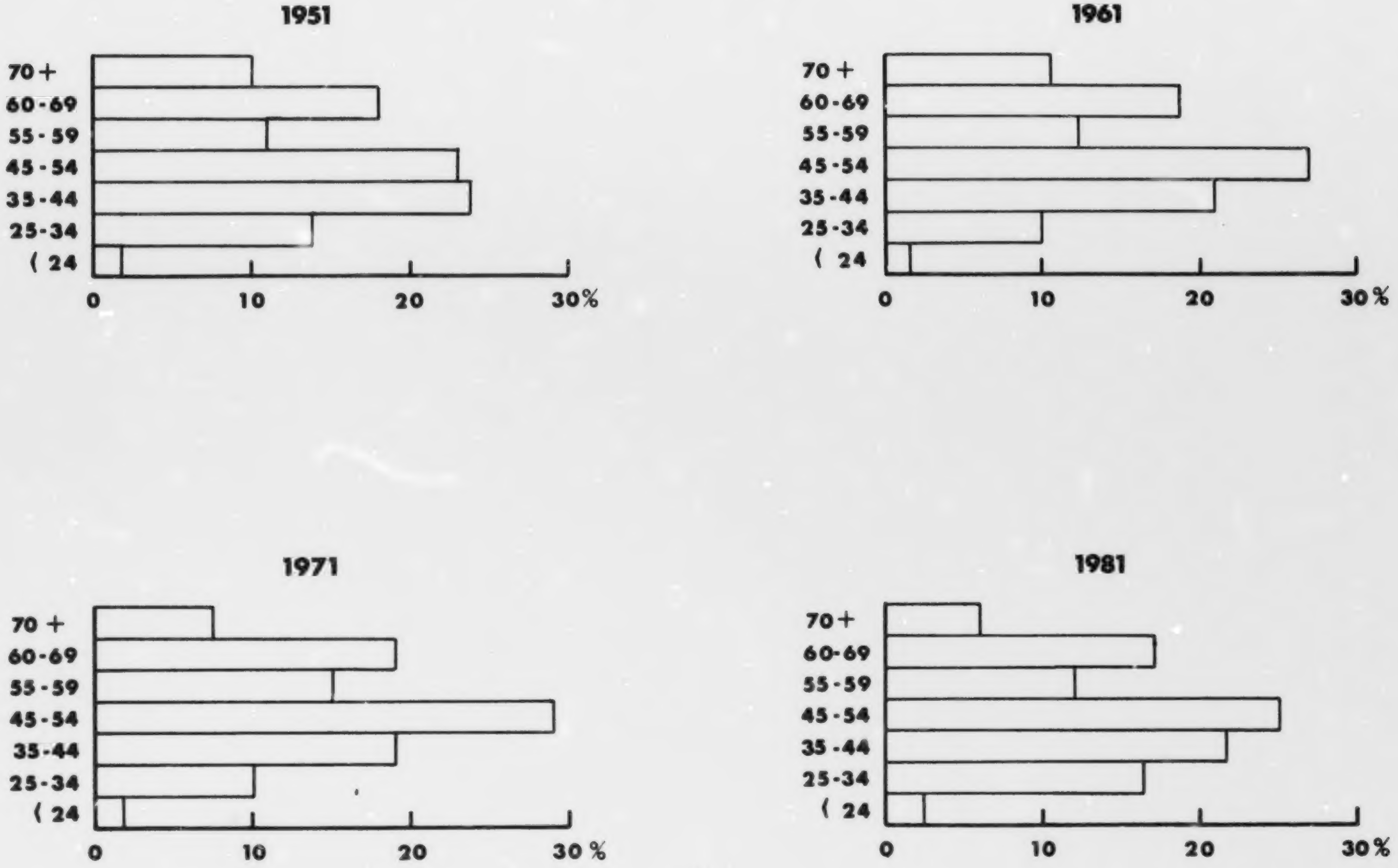
	1951	1961	1971	1981	% Change 1951-1981
Vegetables (ha)	2,186	3,512	6,416	8,773	+401.2
% of all farms	5.2	7.1	10.5	10.8	
Area/farm (ha)	0.7	1.3	3.6	6.3	
Tree Fruits (ha)	9,920	6,363	5,793	5,499	-44.6
% of all farms	---	5.9	5.2	5.6	
Area/farm (ha)	---	3.2	6.5	7.5	
Small Fruits (ha)	1,170	5,329	4,397	9,685	+827.8
% of all farms	---	---	---	9.5	
Area/farm (ha)	---	---	---	7.9	

Source: Census of Agriculture

Note: Average area per farm derived using number of farms reporting fruits and vegetables, not total number of farms.

FIGURE 2.2

AGE OF OPERATOR, ATLANTIC CANADA, 1951-1981



losses of land to the industry, land which has, to a significant extent, grown back into scrub and trees. Undoubtedly, much of the land lost was unsuitable for modern agriculture, but it is impossible to avoid the fact that much is of relatively high capability.

There are regional variations in the decline of agriculture throughout Atlantic Canada, and the balance of this report deals with one of these variations in Eastern New Brunswick. This is an area where the demise of agriculture has been all but absolute in spite of appreciable reserves of higher capability land.

Eastern New Brunswick: An Introduction

Gloucester, Northumberland, and Kent counties cover about 30 per cent of the total area of New Brunswick (Figure 2.3). They front on the Northumberland Strait to the east, and the Bay of Chaleur to the north. The area witnessed some of the earliest penetration and settlement by Europeans in Canada; sites of trading posts dating back to the first decade of the seventeenth century have been identified up and down the eastern shore.

The area still embraces an overall cultural homogeneity with wedges of diversity. It represents the surviving heartland of Acadian settlement, and the population is still predominantly French-speaking (Table 2.12). There are two important exceptions to this rule. English becomes relatively more important in the larger urban centres, such as Bathurst and the towns of the lower Miramichi, but not to the exclusion of French by any means. And the axis formed by the Miramichi has been a magnet attracting more capital-intensive industry, mainly based on forestry and mining, for many decades. The Miramichi region, therefore, is predominantly English and forms a wedge between the Acadian centres in Gloucester to the north and Kent to the south.

All three counties remain predominantly rural in nature as defined by the census (66 per cent of the population in Gloucester in 1981, 72 per cent in Northumberland, and 86 per cent in Kent), mostly based in small villages. The area has remained rural while the rest of Atlantic Canada has tended to concentrate in towns.

Detailed census of agriculture data for selected indicators reveal the relative fortunes of agriculture in each of the three counties since 1951 (Table 2.13). The number of farms, area in farms, improved area, and cropped area have, almost without exception, declined rapidly. As in other parts of Atlantic Canada, however, size of farms is bigger in 1981 than in 1951, both in terms of land and of capital. Improved area also tends to take up a larger proportion of all land in farms (25 per cent for all three counties combined in 1951, 42 per cent in 1981). Livestock numbers per farm are also bigger in 1981 than in 1951, but still tend to compare quite badly with the Atlantic average; number of milk cows per farm in Gloucester County in 1981, for example, was only about half the regional average.

These trends apply especially to Kent County which counted almost 86 per cent of its total population in 1981 as rural. In many ways Kent is typical of the more serious agricultural decline of Eastern New Brunswick

FIGURE 2.3

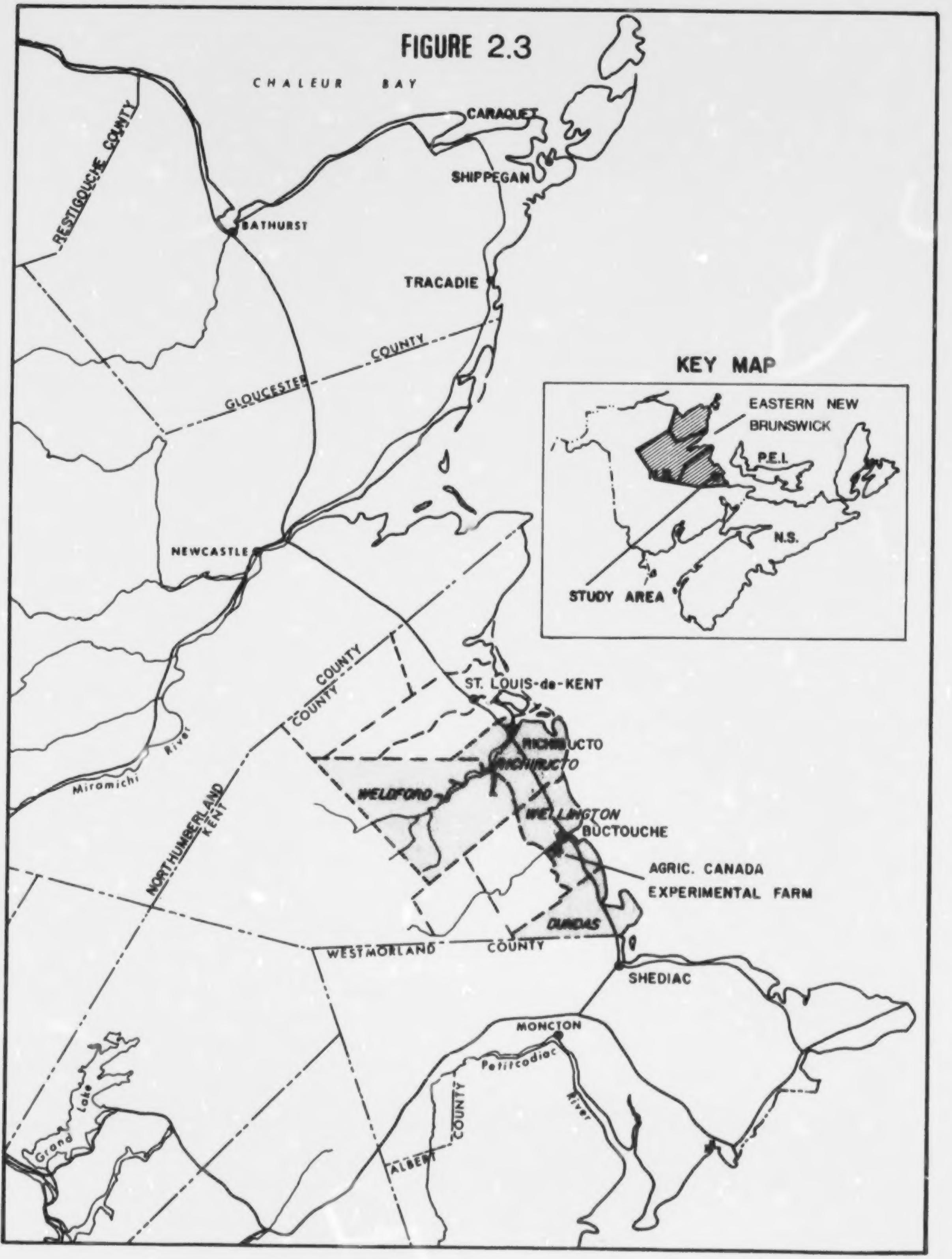

CHALEUR BAY
CARAQUET
SHIPPEGAN
BATHURST
RESTIGOUCHE COUNTY
TRACADIE
GLOUCESTER COUNTY
NEWCASTLE
Miramichi River
NORTHUMBERLAND COUNTY
KENT COUNTY
ST. LOUIS-de-KENT
RICHIBUCTO
RICHIBUCTO
WELDFORD
WELLINGTON
BUCTOUCHE
AGRIC. CANADA EXPERIMENTAL FARM
DUNDAS
WESTMORLAND COUNTY
SHEDIAC
MONCTON
Petitcodiac River
ALBERT COUNTY
Grand Lake
KEY MAP
EASTERN NEW BRUNSWICK
P.E.I.
N.B.
N.S.
STUDY AREA

TABLE 2.12

BASIC POPULATION DATA, ATLANTIC CANADA, EASTERN NEW BRUNSWICK, AND KENT COUNTY, 1951-1981

	1951	1961	1971	1981
Total Population				
Atlantic Canada	1,618,126	1,897,425	2,057,262	2,234,025
E. New Brunswick	127,250	143,045	151,214	171,089
Kent County	26,767	26,667	24,901	30,800
Urban Population (%)				
Atlantic Canada	45.7	49.8	55.9	53.6
E. New Brunswick	14.0	21.8	36.6	28.5
Kent County	5.2	10.9	15.3	14.1
Rural Population (%)				
Atlantic Canada	54.3	50.2	44.1	46.4
E. New Brunswick	86.0	78.2	63.4	71.4
Kent County	94.8	89.1	84.7	85.9
English-Speaking (%)				
Atlantic Canada	84.1	84.6	85.6	86.0
E. New Brunswick	33.5	34.4	37.6	35.3
Kent County	16.6	15.1	16.0	19.7
French-Speaking (%)				
Atlantic Canada	14.5	13.8	12.9	12.5
E. New Brunswick	65.4	64.1	61.1	63.6
Kent County	81.7	81.9	80.2	78.6

Source: Census of Population

TABLE 2.13

SELECTED AGRICULTURAL STATISTICS FOR EASTERN NEW BRUNSWICK:

GLOUCESTER, NORTHUMBERLAND, KENT COUNTIES 1951-1981

	1951	1961	1971	1981
Total Number of Farms				
Gloucester	4,571	1,085	365	188
Northumberland	2,789	891	215	158
Kent	2,328	1,103	401	252
Total Area in Farms (ha)				
Gloucester	137,209	50,286	21,838	17,833
Northumberland	102,952	44,716	13,311	11,467
Kent	108,190	72,112	34,883	21,834
Total Improved Area (ha)				
Gloucester	32,352	16,049	7,736	6,791
Northumberland	19,456	9,387	4,085	4,576
Kent	36,839	25,540	13,183	10,362
Total Cropped Area (ha)				
Gloucester	22,631	10,558	5,057	4,999
Northumberland	13,730	6,156	2,380	3,126
Kent	24,994	15,377	7,220	6,839
Average Area per Farm (ha)				
Gloucester	30	46	60	95
Northumberland	37	50	62	73
Kent	46	65	87	87
Average Improved Area per Farm (ha)				
Gloucester	7	15	21	36
Northumberland	7	10	19	29
Kent	16	23	33	41
Number of Milk Cows per Farm				
Gloucester	2.1	3.8	7.2	16.2
Northumberland	2.3	5.0	9.1	18.8
Kent	3.3	3.3	9.2	15.0
Number of Hogs per Farm				
Gloucester	2.4	3.5	25.2	104.6
Northumberland	2.6	4.8	8.6	82.7
Kent	4.1	4.0	26.7	76.7
Total Capital Value per Farm ($) (1)				
Gloucester	4,089	8,031	13,248	29,918
Northumberland	4,194	7,213	12,293	24,723
Kent	4,643	6,280	13,491	26,854
Value of Land and Buildings per Farm ($) (1)				
Gloucester	3,128	5,855	8,477	21,327
Northumberland	3,158	5,177	5,905	16,244
Kent	2,741	3,562	7,372	17,404
Value of Land and Buildings per Improved ha ($) (1)				
Gloucester	104	396	400	590
Northumberland	453	491	416	561
Kent	173	154	224	423

Source: Census of Agriculture

Note: (1) Expressed in 1951 dollars

compared to Atlantic Canada (Table 2.14). This, of itself, denotes a particularly unfortunate situation since reserves of higher capability land in Kent are substantial, and it is located closer to one of the region's main distributing and service centres at Moncton. Measurements of land capability for agriculture indicate that more than half of Eastern New Brunswick is classified under the Canada Land Inventory (CLI) as classes 3 and 4, suitable for general arable use (Table 2.15). This represents a higher proportion than these two classes in all of New Brunswick and, perhaps more significantly, the amount of land in each of the two classes located in Eastern New Brunswick is a substantial part (about 35 per cent) of the total provincial reserves of similar capability. Overall trends in agriculture in Eastern New Brunswick reflect those of the Atlantic region as a measures the decline has been much more substantial in New Brunswick. The following chapters will explore in more detail some of the reasons for this, specifically by concentrating analysis on Kent County.

TABLE 2.14

TRENDS IN SELECTED AGRICULTURAL INDICATORS AT THREE LEVELS IN ATLANTIC CANADA 1951-1981

	Atlantic Canada	Eastern New Brunswick	Kent County
% Change in Number of Census Farms	-79.7	-93.8	-89.2
% Change in Farm Population	-86.0	-97.1	-95.1
% Change in Total Farmland	-61.5	-85.3	-91.8
% Change in Total Improved Land	-38.5	-75.5	-71.9
% Change in Value of Land and Buildings (1)	+34.3	-62.8	-31.3
Land value/ha 1951	$80.75	$84.66	$70.10
Land value/ha 1981	$281.37	$214.37	$200.87
% Change in Land Value/ha 1951-81	+348.4	+253.2	+286.5
Average Farm Size 1951 (ha)	50	36	46
Average Farm Size 1981	94	86	87
% Change in Average Farm Size 1951 to 1981	+88.0	+238.9	+89.1
Improved Area per Farm 1951 (ha)	15	9	16
Improved Area per Farm 1981	36	45	41
% Change in Improved Area per Farm 1951 to 1981	+240.0	+500.0	+283.8

Source: Census of Agriculture

Note: (1) Expressed in 1951 dollars

TABLE 2.15

CAPABILITY OF LAND FOR AGRICULTURE EASTERN NEW BRUNSWICK

(a) CLI Capability Class	Eastern New Brunswick	% of Total Area of Eastern New Brunswick	Area of Each Class as % Total Area of New Brunswick	Area of Each Class in Eastern New Brunswick as % of Provincial Total in Each Class
	Hectares	%	%	%
2	------	-----	2.2	-----
3	405,485	18.9	16.1	35.2
4	729,270	34.1	28.5	35.9
5	415,213	19.4	23.8	24.4
6	3,911	0.2	0.2	33.9
7	506,640	23.4	25.7	27.3
8 (b)	1,867	0.1	1.6	1.6
Organic	83,594	3.9	1.8	63.0
TOTAL	2,140,979	100.0	100.0	30.0

Source: Fisheries and Environment Canada, 1977

Note: (a) See Appendix C for a brief description of the CLI agricultural capability classes.

(b) A special classification to include small coastal islands not classified for agriculture and designated urban areas.

CHAPTER THREE

CHANGES AFFECTING AGRICULTURAL LAND IN KENT COUNTY

The extent of farmland abandonment in Kent County has been substantial, and has occurred in spite of a proportion of higher capability soils which exceeds that either of Eastern New Brunswick or the province as a whole. Moreover, abandonment has continued in a county that has a well-developed network of roads, after more than two centuries of settlement and rural development, and is close to one of the Atlantic region's most important service and distribution centres at Moncton. Several questions arise:

- What is the actual extent of farmland abandonment in Kent County, and where is this land located?
- Why has this land been abandoned, given favourable physical attributes and proximity to regional markets?
- What are the future agricultural prospects for Kent County relative to its physical and economic potential?

These questions have been investigated by means of several methods:

a) a detailed survey of the use of cleared, or formerly cleared, land in four parishes in southern and eastern Kent County;

b) an analysis of census data (see Chapter Two);

c) a comprehensive interview survey of 27 landholders in the Kent County study area. This, it should be re-emphasized, was not intended to give a statistically significant array of data, but more to provide an indication of the range of landholder experiences and responses to rural change; and

d) extensive conversations with professionals experienced in agricultural and other resource-based planning and management issues in Eastern New Brunswick.

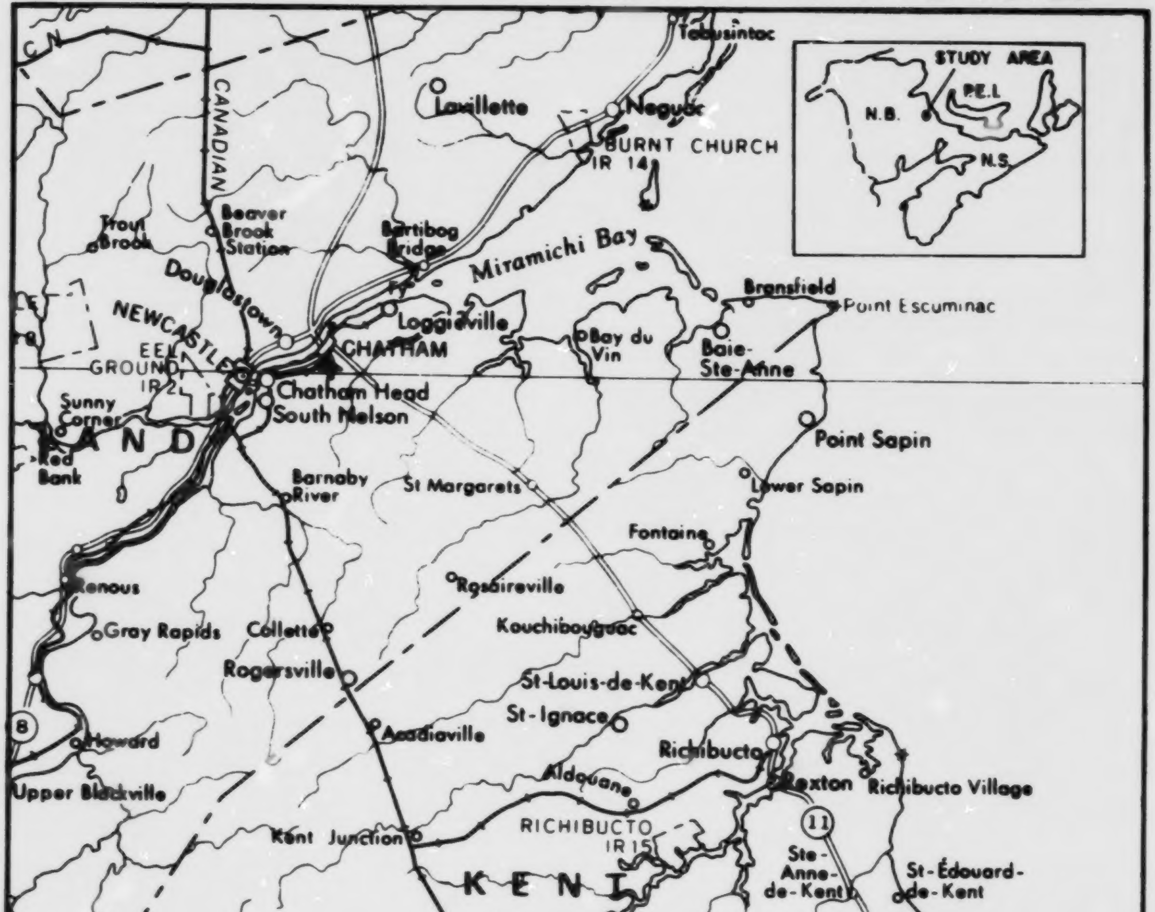
This chapter introduces Kent County as an example of retreating agricultural margins in Atlantic Canada, and analyses the main processes of land-use change over the past two decades.

Kent County: An Introduction

Kent County is triangular in shape with its eastern base fronting the Northumberland Strait (Figure 3.1). The vast bulk of settlement and development is in the eastern two-thirds of the County, bounded to the west by the railway running north-south between Moncton and the Miramichi. This area is low-lying and undulating, part of an eroded plateau with alternating layers mainly of sandstone and shale. Glaciation has modified drainage patterns, and there is extensive incidence of peatbogs and fens.

The coastline is characterized by low sand dunes and offshore bars and spits. The coast is broken by a series of drowned river valleys, of which the most important are the Cocagne, Buctouche, Richibucto, Kouchibouguacis, and Kouchibouguac. All the

FIGURE 3.1 KENT CO. MAJOR CULTURAL FEATURES


STUDY AREA
N.B.
P.E.I.
N.S.
CN
CANADIAN
Tabusintac
Lavillette
Neguac
BURNT CHURCH
IR 14
Trout Brook
Beaver Brook Station
Bartibog Bridge
Miramichi Bay
Douglastown
NEWCASTLE
Loggieville
CHATHAM
Bay du Vin
Bransfield
Point Escuminac
Baie-Ste-Anne
EEL GROUND IR 2
Chatham Head
South Nelson
Sunny Corner
AND
Red Bank
Point Sapin
Barnaby River
St Margarets
Lower Sapin
Fontaine
Renous
Rosaireville
Gray Rapids
Collette
Kouchibouguac
Rogersville
St-Louis-de-Kent
St-Ignace
8
Howard
Acadiaville
Richibucto
Upper Blackville
Aldouane
Rexton
Richibucto Village
11
Kent Junction
RICHIBUCTO
IR 15
Ste-Anne-de-Kent
St-Édouard-de-Kent
KENT
Buctouche
Harcourt
Ste-Marie-de-Kent
St-Thomas-de-Kent
Adamsville
River
Coal Branch Station
Saint-Paul
St Anthony
Cocagne-Nord
NATIONAL
Notre-Dame
Grande-Digue
Shediac Bay
Salmon
Bronson Settlement
Canaan Station
NATIONAL
River
Shediac
11
Dorchester Crossing
WESTMORLAND
MONCTON
St-Anselme
2
6
Salisbury
Riverview Heights
Cumberland Bay
Canaan
River

rivers are short and wide in their lower courses, and tend to extend coastal climatic regimes inland to a degree quite significant for agriculture and settlement.

The history of the County forms a microcosm of the history of Acadia itself. Pre-European settlement was mostly along the shoreline and up the main river valleys, as the water formed both a means of living and a means of communication. The area around Richibucto, at the mouth of the river of the same name, was an important centre of the Micmac nation. This same general area was the first to be settled by French immigrants before the end of the seventeenth century, although this initiative had been preceded by semi-permanent fishing settlements (some under the sponsorship of Samuel de Champlain), and a Jesuit mission built at Richibucto in 1646.

These first European settlers found quite a difficult land in comparison to the one they had left. The soils are mainly thin podzols, the development of which is facilitated by long cold winters and short, cool summers. This continental climate was only slightly tempered by the sea away from the coast. Records between 1951 and 1980 reveal in excess of 120 days without frost along the coast on average (with a range from 83 days to 155 days), but this drops off sharply even just a short distance inland (Table 3.1). Relatively steep, rolling hills also create frost pockets (Environment Canada, 1982).

Dispersal of the Acadians by the British in 1755 saw many of the first settlers scatter inland before regrouping over the next few decades. Many fled northwards to Gloucester County, on the fringes of British influence. Organized Acadian settlement was permitted up and down the east coast from the 1760s onwards with a mixture of land grants and squatting tolerated away from areas in which the British (and later Loyalists) had little interest. Land was granted around Cocagne in 1772, and an Acadian settlement at Richibucto was established by 1790. This village was raised to the status of shire-town in 1826.

Control of economic activity, however, moved firmly to non-Acadian hands. A prosperous shipbuilding industry was based on the Miramichi to the north, with outposts up and down the coast. Loyalists established shipbuilding and woodworking after 1787 at Richibucto (called then New Liverpool) and this provided a base for development of the interior, largely by Scots and Irish immigrants.

Settlement at this time was based on forestry, farming, and fishing, and has largely maintained this pattern to the present day. Immigration of non-French speaking people was largely balanced by a high rate of natural increase among the Acadians. Both combined to promote a high increase in population to the mid-19th century when immigration suddenly ceased. Natural increase then took over, and Acadian numbers began to dominate, particularly along the coast. There was no appreciable increase in total population, however, between 1881 (22,600 people) and 1971 (24,900 people). Extensive periods of emigration to find work have characterized the County, for example between 1911 and 1931, and from 1941 to 1971. For the first time in its history, Kent County recorded a population of over 30,000 in the 1981 census.

TABLE 3.1

FROST DATA, COASTAL AND INLAND KENT COUNTY 1951-1980 AVERAGES

	Average Frost-Free period (days)	Last Frost (Spring)	First Frost (Fall)
Coastal Stations			
Buctouche	127	May 23	September 28
Kouchibouguac	120	May 26	September 24
Rexton	121	May 24	September 23
Inland Station			
Harcourt	78	June 15	September 15

Source: Environment Canada, 1982

The economic base of the County has a little more diversity in the early 1980s than at any time in its history, but is still firmly linked to land and sea. Natural vegetation is forest, with black spruce, cedar, and tamarack in badly-drained areas, silver birch and jack-pine in sandy areas, tamarack, sugar maple, yellow birch, and beech on better land.

There is a fairly substantial forestry industry, both cutting pulp for the paper mills of the Miramichi, and for local sawmills. The Kent Industrial Commission (1982) listed a total of six sawmills in the County in 1980, producing more than 8 million board feet of lumber. There were, at that time, other more specialized mills operating, including two custom sawmills with very small output (200,000 mfbm), two lath mills and one pallet manufacturer. All these mills are quite small, employing less than 50 persons each. Forest products from census farms were not very significant in 1980; about $72,000 worth of products were sold from 47 farms in Kent County. This compares to more than $500,000 in sales for 1951 (in 1951 dollars).

Land-based extractive industries take two typical forms in Kent County, peat moss and gravel/fill. There are three peat-moss processors in the County, and the construction of a new highway northwards from Moncton over the past decade or so has seen demand for fill increase.

Fishing remains an important part of the local economy, with 14 processors in the County preparing a variety of species for market. It is mostly an inshore effort, based on herring and lobster and with specialist emphasis on oysters, clams and Irish moss.

Tourism has become an important dollar-earner in Kent County. The Acadian landscape and culture, as well as the extensive sand beaches and warm-water swimming, have attracted town-dwellers from all over southern New Brunswick to build cottages along the shoreline during the past two decades. Initially, the small port of Shediac (immediately to the south of the county line, in Westmorland County) was the focus of this development, but as the population of Moncton and disposable incomes have increased, there has been extensive shoreline development at least as far north as Buctouche. Establishment of the Kouchibouguac National Park in the 1970s in the north of the County has not increased visitation as much as anticipated. Although the park embraces great natural beauty, sandy beaches, and canoe waterways, an intractable expropriation problem has dogged its development.

Remaining industry encompasses a wide variety of small enterprises, largely concentrated on resource-based manufacturing, construction, trucking, and household supplies and services. These small enterprises are mostly located in a series of small towns and villages. The biggest are on or very near the coast, and are (from the north) St-Louis-de-Kent, Richibucto, Rexton, Buctouche, and Cocagne.

Agriculture in Kent County: An Introduction

Much of Kent County (72 per cent) is covered by CLI classes 3 and 4 capability soils (Table 3.2). There are large areas of lower capability soils in the north and south, with extensive organic deposits. Many of the higher capability areas are in complexes with lower classes. Major limitations are imposed

TABLE 3.2

LAND CAPABILITY FOR AGRICULTURE IN KENT COUNTY

Class	Area	Percentage of Total
	- hectares -	- per cent -
3	137,124	30.2
4	189,617	41.7
5	31,142	6.8
6	902	0.2
7	63,716	14.0
8 (a)	10	(b)
0	31,786	7.0
TOTAL	454,297	100.0

Source: Fisheries and Environment Canada, 1977

Notes: (a) small coastal islands not classified for agricultural capabilities.

(b) less than 0.05 per cent.

by excess water, undesirable soil structures and/or low permeability, and low natural fertility (Table 3.3).

Although agriculture has declined more severely in Kent than in the Atlantic region as a whole, there remain pockets of relative prosperity. These are based both on traditional types of farming (dairy, poultry, hogs, and potatoes) with a fair sprinkling of newer types of specialization (notably fruits, cole crops, and tobacco). The latter crops usually occupy a relatively small number of farms each, concentrated in localized pockets. The former are more widely distributed, and represent the essential core which has survived the depredations of the past 30 years.

The 1981 census of agriculture counted 252 farms in Kent County, down from 2,328 in 1951 (Table 3.4). This 90 per cent decline has been fairly evenly spread over the three decades and has been accompanied by an 80 per cent decline in the area of land in farms. Those farms which have survived are much larger, however, and include a larger proportion of cleared land. Average farm size, average improved area per farm, and average crop area have stayed quite close to the Atlantic average. By other indicators, however (including number of milk cows and pigs per farm, value of land and buildings per farm, total capital value per farm, and value of land and buildings per hectare and improved land) Kent has made no substantial gains, and has usually lost ground, when compared to the Atlantic average. There are signs that the 1970s represented a reversal of this trend with movements towards the regional average.

All these trends tend to confirm a steeper decline in agriculture in Kent County when compared to the regional average. To reiterate, this has occurred despite a goodly reserve of higher capability land for agriculture and a reasonably favourable location vis-à-vis regional markets and distribution centres. It also indicates a large area of agricultural land which is either lying idle, which has reverted to woodland, or which has been converted to other uses.

Land-Use Changes in Kent County 1963-1982

Much of the decline in Kent County agriculture has occurred since 1961, although the downward trend was firmly established in the previous decades. The bottom-most point was reached in the mid-1970s. Since then, a slight recovery has been observed in the amount of land being farmed, which is typical of many areas in the Maritimes (as shown in Chapter 2), and seems to indicate that a minimum threshold size for farm enterprises has been reached and crossed. Increases in energy costs and, as a consequence, transportation costs of food imports in the mid-1970s have also enabled the region's farmers to compete more effectively with imported food, and this has been enhanced by generally higher food prices.

Examination of trends in land-use data between 1963 and 1982 confirms the steep decline over these two decades. The land-use survey was conducted in four parishes of eastern Kent County: Dundas, Wellington, and Richibucto (all on the coast) and Weldford (inland). Collectively, these parishes account for about 30 per cent of the land area of Kent County, but a much larger part of its actively farmed

TABLE 3.3

MAJOR PRIMARY LIMITATIONS TO AGRICULTURE, KENT COUNTY

Limitation	Area Affected	Percentage of Total
	- hectares -	- per cent -
Salinity	322	0.1
Stoniness	8,249	1.8
Bedrock	310	0.1
Combination (1)	222,572	49.0
Topography	3,293	0.7
Excess water	187,755	41.3
TOTAL (2)	422,501	100.0

Source: Fisheries and Environment Canada, 1977

Notes: (1) Combination of two or more of undesirable soil structure and/or low permeability, low fertility, moisture limitations, and salinity.

(2) CLI Classes 8 and 0 were excluded from the analysis of soil limitations.

TABLE 3.4

SELECTED AGRICULTURAL STATISTICS, KENT COUNTY, 1951-1981

	1951	1961	1971	1981
Total number of farms	2,328	1,103	401	252
(as % of ENB) (1)	(20.0)	(35.0)	(40.9)	(42.1)
Total area in farms (ha)	108,190	72,112	34,883	21,843
(as % of ENB)	(31.0)	(43.1)	(49.9)	(42.7)
Total improved area (ha)	36,839	25,540	13,183	10,362
(as % of ENB)	(41.6)	(50.1)	(52.7)	(47.7)
Total cropped area (ha)	24,994	15,377	7,220	6,839
(as % of ENB)	(40.7)	(47.9)	(49.3)	(46.5)
Number of commercial farms (2)	563	337	134	86
(as % of ENB)	(50.8)	(48.2)	(49.3)	(46.5)
Average area per farm (ha)	46	65	87	87
(as % of Atlantic Average)	(92.0)	(98.5)	(104.8)	(92.5)
Average improved area per farm (ha)	16	23	33	41
(as % of Atlantic Average)	(106.7)	(104.5)	(100.0)	(91.1)
Average cropped area per farm (ha)	11	14	18	27
(as % of Atlantic Average)	(110.0)	(93.3)	(81.8)	(87.1)
Number of milk cows per farm	3.3	5.0	9.2	15.0
(as % of Atlantic Average)	(62.3)	(73.5)	(75.4)	(65.8)
Number of hogs per farm	4.1	4.8	26.7	76.7
(as % of Atlantic Average)	(70.7)	(41.0)	(55.4)	(57.6)
Value of land & buildings per farm ($) (3)	2,741	3,562	7,372	17,404
(as % of Atlantic Average)	(68.3)	(57.2)	(56.6)	(65.6)
Total capital value per farm ($) (3)	4,643	6,279	13,491	26,854
(as % of Atlantic Average)	(71.4)	(61.6)	(65.9)	(69.3)
Value of land and buildings per improved ha ($) (3)	173	154	224	423
(as % of Atlantic Average)	(64.2)	(54.9)	(56.5)	(71.8)

Source: Census of Agriculture

Notes:
(1) ENB is Eastern New Brunswick
(2) more than $1,200 in sales in 1951 and 1961, more than $2,500 in sales in 1971, and more than $10,000 in sales in 1981.
(3) in 1951 dollars.

land (between 60 and 70 per cent).*

Agriculture has remained an important source of activity in the four parishes until the 1980s, although a much smaller area is actually farmed. As in preceding years there is an emphasis on livestock farming, with specialist production, including fruits, vegetables, potatoes, and tobacco being pursued by the balance of commercial farm operators. This mixture of farming types is reflected in census data for field crops and livestock since 1951 (Table 3.5). Hay and various traditional grains have remained important in the study area, but have all lost area since 1951. The only increases in area since 1951 have been for tobacco, corn, and some vegetables. Certain of these vegetables, and some of the grains, are grown in rotation with tobacco. The general decline in forage crop area in Kent County has matched the decline in livestock numbers over the same time period.

The land-use survey conducted in 1982 covered 30,197 hectares of land in the four parishes which were either cleared in both years under study, or showed identifiable signs of having been cleared and farmed at some stage in the relatively recent past. This represents a little less than one quarter (23 per cent) of the total area of the four parishes with the balance of the area being mostly in some form of forested use. (Only when this forested land has been cleared for some other use was it coded as part of the land-use survey). Tables 3.6 and 3.7 show aggregate data for the land uses in the four parishes in 1963 and 1982. In 1963, agricultural uses accounted for almost 60 per cent of all cleared land, a total of 17,899 hectares. This area for the four parishes corresponds quite well with the 25,540 hectares of total improved land identified by the 1961 census in all of Kent County (Table 3.4). Most of this agricultural area (16,880 hectares) was extensively used, mainly for hay and pasture. By 1982, the actively farmed area had declined to less than 35 per cent of all cleared land, or 10,541 hectares. All of the net loss was from extensive agriculture, with only half remaining in this use in 1982 when compared to 1963. There was a net gain to intensive agriculture (annual tillage crops, berries, fruits, and Christmas tree cultivation) with the area almost doubling over the 1963-1982 period from 1,019 hectares to 1,985 hectares.

The area of idle or restocking* land moves almost in exact inverse correlation with actively farmed land over the two decades. This formerly farmed area accounted for 38 per cent of all the surveyed area in 1963 (11,511 hectares), and for almost 60 per cent of the area in 1982 (17,984 hectares). In aggregate, this is a remarkably exact exchange of land between the two major groups of uses, and indicates an overall reduction in the intensity of use as the land use changes from being cropped or grazed, to idle, and on through the various stages of reversion to forest.

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*Exact figures cannot be obtained because of confidentiality restrictions placed on census data.

*Occasionally in this report, "restocking land" may be referred to as "reverting land". The two are synonymous for purposes of the present analysis.

TABLE 3.5

CROPS AND LIVESTOCK, KENT COUNTY, 1951-1981

	1951	1961	1971	1981
		- hectares -		
Tame hay	15,417	10,142	4,761	4,489
Oats for grain	5,791	3,435	1,262	616
Barley	493	108	221	310
Potatoes	927	461	73	172
Oats for fodder	585	260	251	156
Wheat	584	305	95	153
Buckwheat	532	132	26	145
Tobacco	---	4	93	142
Mixed grain	155	294	216	96
Corn for silage	9	23	42	85
Total area of all field crops	24,514	15,212	7,133	6,406
Beans	1	---	(a)	102
Cauliflower	---	---	2	28
Cabbage	2	1	2	23
Sweet corn	3	3	5	19
Turnips (b)	168	68	1	12
Total area of all vegetables	180	77	17	282
Apples (number of trees)	7,114	5,175	4,072	5,443
Strawberries	36	21	19	23
		- number -		
Total cattle	13,183	12,093	8,433	6,694
Milk cows	6,459	4,715	2,106	1,007
Pigs	6,606	2,766	3,420	4,218
Sheep	5,661	4,817	1,893	315
Hens and chickens	93,869	86,620	240,088	150,812

Source: Census of Agriculture

Notes: (a) less than 0.5 hectares.

(b) turnips were classified as field crops in the 1951 and 1961 census, and were more widely used as fodded crops then.

TABLE 3.6

LAND USE IN FOUR PARISHES, KENT COUNTY, IN 1963

Land Use	Area	Proportion of Cleared Area	 Total Area
	- hectares -	- per cent -	
Intensive Agriculture	1,019	3.4	0.8
Extensive Agriculture	16,880	55.7	12.7
All Agriculture	17,899	59.1	13.5
Idle	5,353	17.7	4.0
Restocking	6,153	20.3	4.6
Former Agriculture	11,511	38.0	8.6
Urban	579	1.9	0.4
Recreational	82	0.3	0.1
Other	226	0.7	0.2
Other Non-Forestry	887	2.9	0.7
All Cleared	30,297	100.00	22.7
Residual (Forestry)	103,120	0.0	77.3
Total Area (Four Parishes)	133,417	---	100.0

Source: Maritime Resource Management Service, Geo-Base System, Land-Use Survey.

TABLE 3.7

LAND USE IN FOUR PARISHES, KENT COUNTY, IN 1982

Land Use	Area	Proportion of Cleared Area	Total Area
	- hectares -	- per cent -	
Intensive Agriculture	1,985	6.5	1.5
Extensive Agriculture	8,556	28.2	6.4
Active Agriculture	10,541	34.7	7.9
Idle	5,182	17.1	3.9
Restocking	12,802	42.3	9.6
Former Agriculture	17,984	59.4	13.5
Urban	1,396	4.6	1.0
Recreational	199	0.6	0.1
Other	176	0.6	0.1
Other Non-Forestry	1,771	5.8	1.2
All Cleared	30,297	100.00	22.7
Residual (Forestry)	103,120	0.0	77.3
Total Area	133,417	---	100.0

Source: Maritime Resource Management Service, Geo-Base System, Land-Use Survey.

Idle land in 1963 covered 5,353 hectares, or 17.7 per cent of the surveyed (cleared) area. This area remained almost constant over the 19 years to 1982 indicating a fairly continuous flow of land from being actively farmed to this first stage of restocking with trees. The exact same fields which were classified as idle in 1963, however, would only in very exceptional circumstances be classified as idle in 1982; such an area would have been brought back to agricultural use after 1963 and then abandoned again as 1982 approached. Most of the idle area in 1963 would have progressed to the restocking or restocked phase by 1982 which explains, in part, the big increase in the area of restocking land during the study period, from 6,153 hectares in 1963 to 12,802 hectares in 1982. Also, within the 1963-1982 study period, some land would have progressed from being actively farmed to restocked with shrubs and trees, having passed through the transitional idle stage during the intervening years.

Land classified as idle or restocking still represents an agricultural reserve that to varying degrees can be readily mobilized, depending on the extent to which trees, shrubs, and bushes have begun to recolonize abandoned fields. In the Maritimes, the first dwarf spruce, fir, or alder will appear on fields within three to five years after last cropping or grazing. Up to this time, such lands can be regarded as still cleared and usable for agriculture; it is idle land, however. Once woodland recolonization is established, however, and the original field lines are increasingly indistinct (i.e. restocking land), reclamation of this land for farming purposes becomes more and more expensive and difficult. Even then, a period of "light restocking", perhaps up to 10 or 15 years after final farm use, offers opportunities for reclearing. This phase in the process is defined as when reclearing could be achieved by use of relatively light machinery such as a bush-cutter and heavy plough. When heavier equipment (bulldozers and the like) is required, fundamental reversion to forest has been achieved. (For a discussion of the physical processes of restocking fields, refer to Crickmer, 1981).

The actual continuum between cleared land and woodland cannot be reduced to a series of simple steps in terms of the degeneration of that land as an agricultural reserve. Generally, this degeneration occurs at a more rapid pace than recolonization by trees, once year-to-year maintenance of infrastructure is neglected. Fences fall down, drainage ditches fill up with sediment and vegetation, culverts and tile-drains rapidly degenerate. Both ground- and surface-water drainage patterns are impeded as a result. Tree roots bring deeper-lying boulders closer to the surface. Thus, although surface clearing of vegetation is relatively easy to deal with, clearing of root systems and rock, and restoring adequate drainage, adds enormously to the overall costs of reconditioning idle or restocking land for farm use.

Neither urban nor recreational uses were substantial in terms of aggregate area in 1963 (a combined proportion of 2.2 per cent of the surveyed area), but by 1982, these uses had increased more than twofold to 1,595 hectares or 5.2 per cent of the surveyed area. Most of this gain has been to urban-type development, including highways, houses, and factories.

Localized recreational impacts occurred mainly along the coast, especially towards the south of the four parishes, closer to Moncton.

Exchanges Between Different Land Uses 1963-1982

Partial disaggregation of the figures in Tables 3.6 and 3.7 can be achieved by combining the two sets of area data into a single table arranged in matrix form. This is shown in Table 3.8. The shaded cells along the main diagonal represent land areas with unchanged uses in the two years. Reading vertically for each land use shows the destination for land between different uses (if any) between 1963 and 1982. Reading horizontally shows the previous use, twenty years earlier, of the 1982 land use.

It has already been shown that the major loss of farmland between 1963 and 1982 was that extensively used for hay and pasture. Table 3.8 reveals this was in two directions. Intensive agriculture had a gain of 1,424 hectares from extensive agriculture which more than offset its losses to non-agricultural uses. And non-agricultural uses gained handsomely at the expense of extensive agriculture; some 7,173 hectares alone went to idle or restocking uses (4,132 plus 3,041 hectares). There was precious little movement of land in the opposite direction, from non-agricultural uses to agriculture. Intensive agriculture gained 280 hectares from idle or restocking uses, and extensive agriculture a further 436 hectares.

Land-use changes affected 14,942 hectares of land between 1963 and 1982, or almost 50 per cent of the total cleared area surveyed. Net gains and losses are shown in Table 3.9 for individual land-use classes. As already mentioned, the biggest net land-use gain in aggregate was to the restocking class from all other classes. It is worth re-emphasizing that this restocking class will inevitably grow in an area, such as Kent County, undergoing severe rural decline and farmland abandonment, as land moves sequentially from active, usually extensive, agriculture through the transitory idle (but still cleared) class, to restocking in bush, shrubs and trees.*

On the other side of the land-use change balance sheet portrayed in Table 3.9, are the significant net losses of land from extensive agriculture (some 9,257 hectares). Table 3.10 outlines the destination use of extensive agricultural land, 1963-1982, indicating that fully three-quarters of this land lies idle or is undergoing restocking to woodland.

Urban expansion, as shown in Table 3.8, has largely been at the expense of agricultural uses (548 hectares, mostly extensive agriculture) and idle fields (176 hectares). This is not surprising considering the relative ease of building houses on already cleared land, with additional benefits such as more suitability of presumably higher

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*This sequence of steps by which farmland eventually reverts to woodland also ensures that the idle category will only achieve a certain size as long as there is only a certain "bank" of actively farmed land on which to draw. The transitory nature of the land passing through this idle class (which includes land for a period of up to five years) means that a land-use survey at any one point can only identify a given area.

TABLE 3.8

COMPARISON OF 1963 AND 1982 LAND USES ON CLEARED LAND IN KENT COUNTY STUDY AREA (in hectares)

		LAND USE IN 1963							
		AGRICULTURE		FORMER AGRICULTURE		OTHER, NON-FORESTRY			
	1963 1982	Intensive Agriculture	Extensive Agriculture	Idle	Restocking	Urban	Recreational	Other	Total 1982
AGRICULTURE	Intensive Agriculture	263	1,424	242	38	(a)	--	18	1,985
	Extensive Agriculture	480	7,623	409	27	1	1	15	8,556
FORMER AGRICULTURE	Idle	198	4,132	801	13	23	1	15	5,182
	Restocking	52	3,041	3,643	6,018	20	2	26	12,802
OTHER, NON-FORESTRY	Urban	22	526	176	33	535	4	100	1,396
	Recreational	---	73	34	9	(a)	73	10	199
	Other	4	61	48	20	(a)	1	42	176
	Total 1963	1,019	16,880	5,353	6,158	579	82	226	30,297

Source: Maritime Resource Management Service, Geo-Base System, Land-Use Survey.

Note: (a) less than 0.5 hectare.

TABLE 3.9

GAINS AND LOSSES OF INDIVIDUAL LAND USES

KENT COUNTY STUDY AREA 1963-1982: SUMMARY (in hectares)

Cleared Area	1963 Land-Use Area (1)	Area Gained 1963-1982 (2)	Area Lost 1963-1982 (3)	1982 Land-Use Area (4)
Intensive Agriculture	1,019	1,722	756	1,985
Extensive Agriculture	16,880	933	9,257	8,556
Idle	5,353	4,382	4,552	5,182
Restocking	6,158	6,784	140	12,802
Urban	579	861	44	1,396
Recreational	82	126	9	199
Other	226	134	184	176
Total	30,297	14,942	14,942	30,297

Source: Maritime Resource Management Service, Geo-Base System, Land-Use Survey. Derived from Table 3.8.

Note: (Column 1) + (Column 2) - (Column 3) = (Column 4).

TABLE 3.10

DESTINATION USE OF LAND LOST FROM EXTENSIVE AGRICULTURE, KENT COUNTY STUDY AREA, SINCE 1963

Destination Use of Land Lost from Extensive Agriculture 1963-1982	Total Extensive Agricultural Land Lost	
1982 Use	per cent	hectares
Intensive Agriculture	15.4	1,424
Idle	44.6	4,132
Restocking	32.9	3,041
Total Former Agriculture	77.5	7,173
Urban	5.7	526
Recreational	0.8	73
Other	0.6	61
Total Other, Non-Forestry	7.1	660
Total	100.0	9,257

Source: Maritime Resource Management Service, Geo-Base System, Land-Use Survey.

capability soils for septic tank installation. The 100 hectares of urban land gained from "other" land uses probably reflect largely a recent highway right-of-way which transects most of the four parishes.

Gains to recreational uses have also largely been at the expense of extensive agriculture and idle fields. Other land uses, including gravel pits and other extractive endeavours, have similarly been attracted to already cleared land.

Location of Land-Use Change

Land being farmed in 1963 was quite widespread throughout the four parishes, with particular concentrations around Cocagne and the Cocagne River in Dundas Parish, extending along the coastline to another concentration along the Buctouche River, and along the Richibucto River system (Figures 3.2 A to 3.5A*). Abandoned land was generally interspersed with this farmed land, to a slightly greater extent in more northerly and inland parts of the four parishes. Idle and restocking fields, however, were still outnumbered by cultivated or grazed fields throughout the area.

By 1982, this situation was substantially reversed, with idle and restocking areas far exceeding actively farmed areas. Remnants of the main concentrations of agriculture in 1963 still remained, but were more widely separated in 1982 as concentrations of idle or reverting land have become dominant (Figures 3.2B to 3.5B). The substantial exchange of land between active agriculture and idle or reverting classes is graphically revealed in Figures 3.2C to 3.5C, and location of the minimal gains to agriculture over the two decades is shown in Figures 3.2D to 3.5D.

In general, abandonment of farmland has been widespread and indiscriminant throughout the four parishes. Area data aggregated by parish reveals that the large absolute losses of extensive agricultural land to idle and reverting occurred throughout all four parishes (Table 3.11). The area of land being intensively farmed also increased in all four parishes, but most noticeably in Wellington and Weldford. Conversion of land to urban or recreational uses occurred especially in Dundas and Wellington parishes (Figures 3.2E and 3.3E). This is not surprising in view of the relative proximity of Dundas to the Moncton urban area, and the location of Kent's biggest town (Buctouche) in Wellington. Growth in urban area throughout the four parishes has tended to centre on the more important communities such as Buctouche, Richibucto, and Rexton, and around the Cocagne River. The most extensive recreational developments have been along the shoreline around Cocagne, reflecting the proximate influence of the Moncton market for recreational properties.

Quality of Agricultural and Former Agricultural Land

Assessment of the quality of the four land-use classes which make up agricultural and former agricultural areas was undertaken for 1982. Quality of land (as measured by capability for agriculture) does not appear to have been a factor in preventing abandonment for farming

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*The geographical location within Kent County of the four parishes depicted on Figures 3.2A to 3.5E inclusive is shown on Figure 2.3

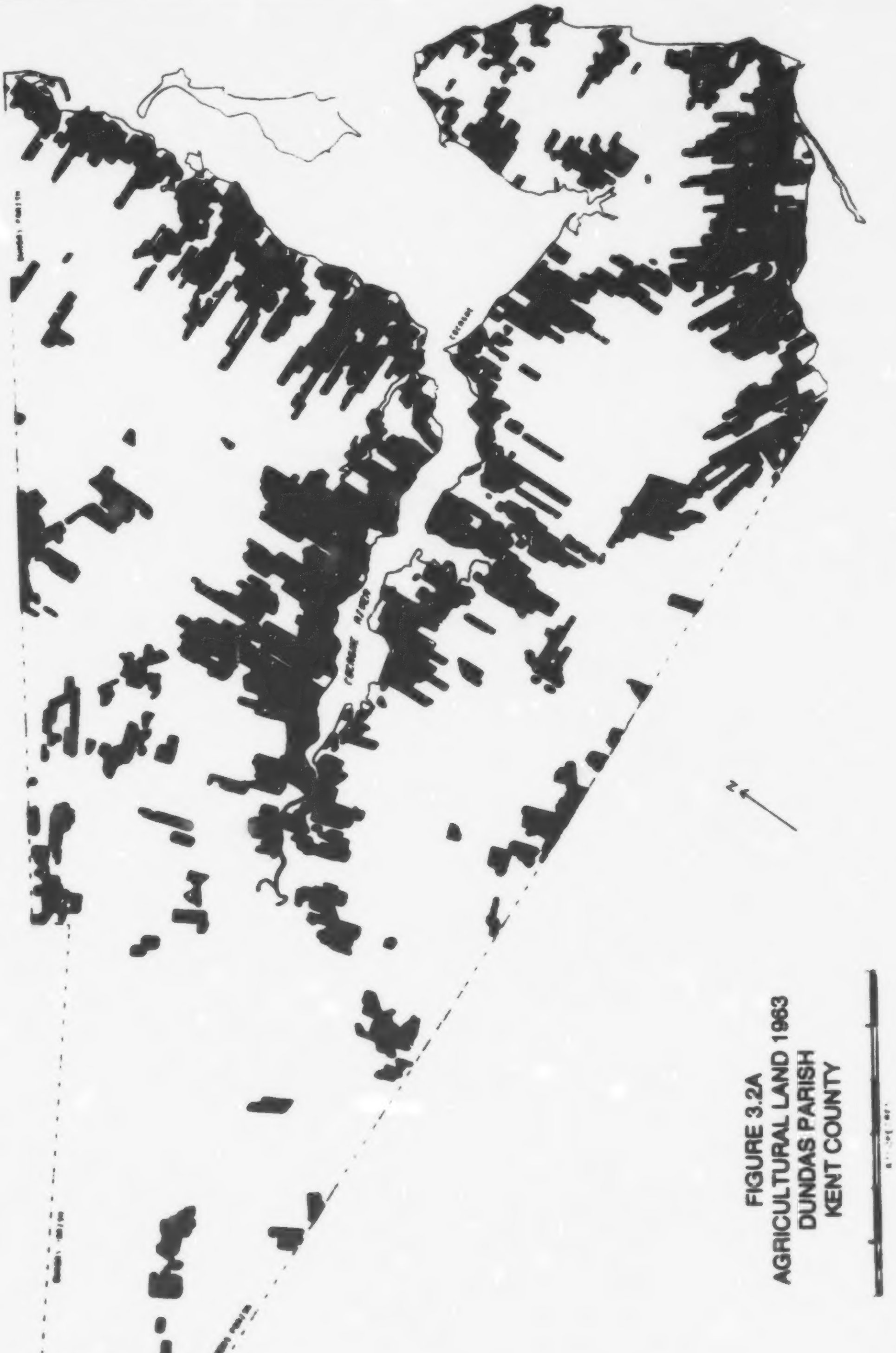


FIGURE 3.2A
AGRICULTURAL LAND 1963
DUNDAS PARISH
KENT COUNTY

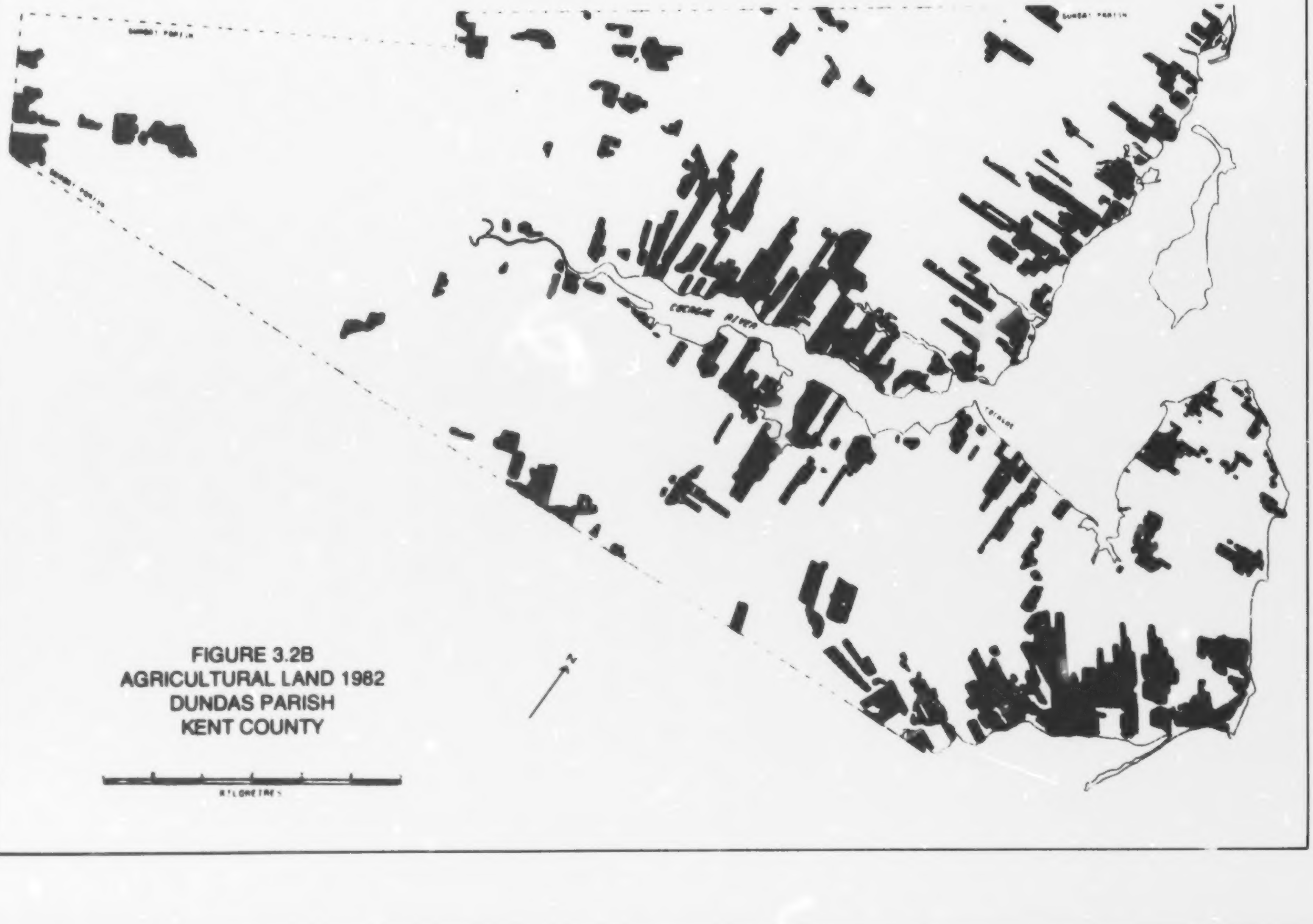

SHEDIAC PARISH
COCAGNE RIVER
N
KILOMETRES

FIGURE 3.2B
AGRICULTURAL LAND 1982
DUNDAS PARISH
KENT COUNTY

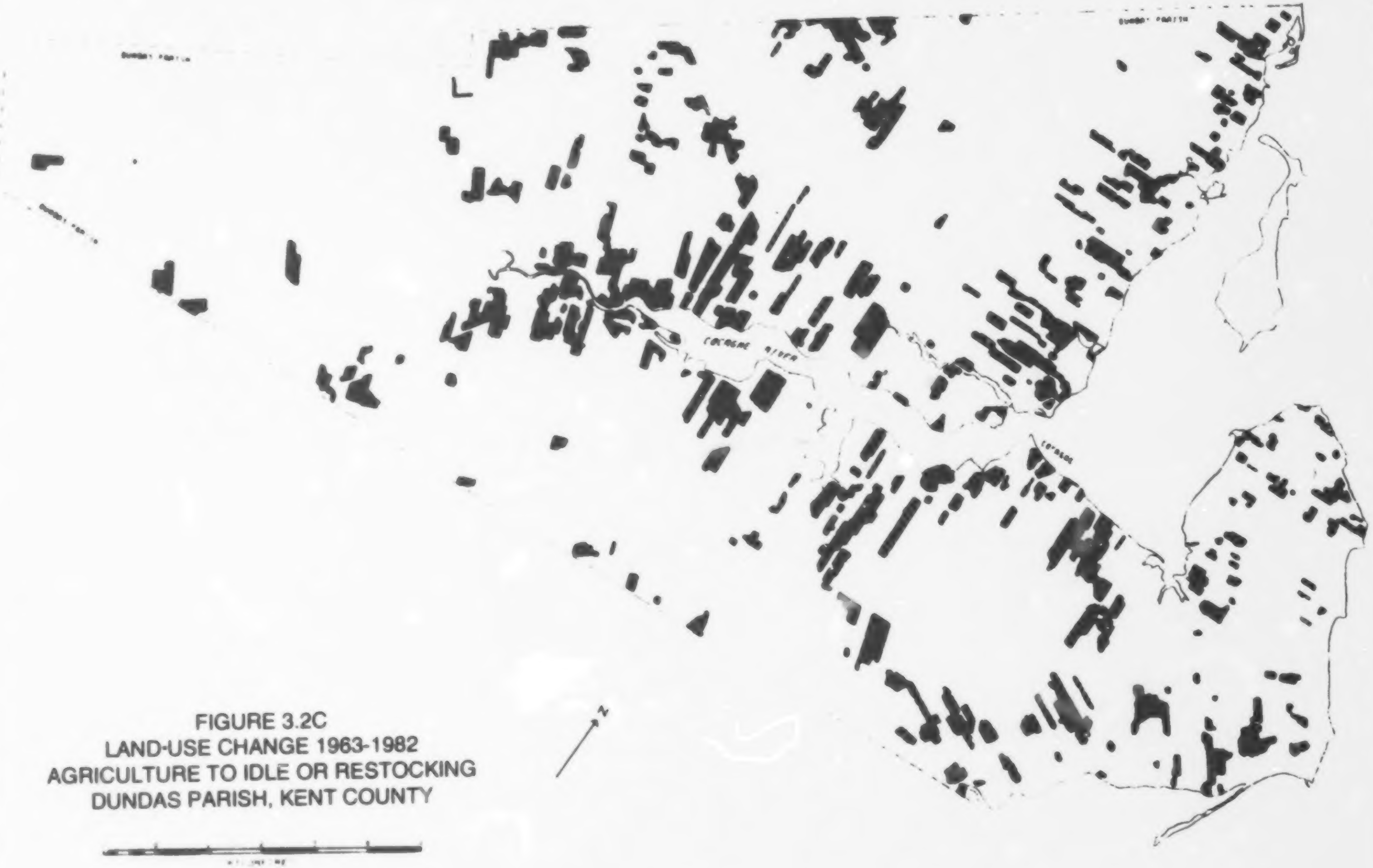

COCAGNE RIVER
COCAGNE
N

FIGURE 3.2C
LAND-USE CHANGE 1963-1982
AGRICULTURE TO IDLE OR RESTOCKING
DUNDAS PARISH, KENT COUNTY

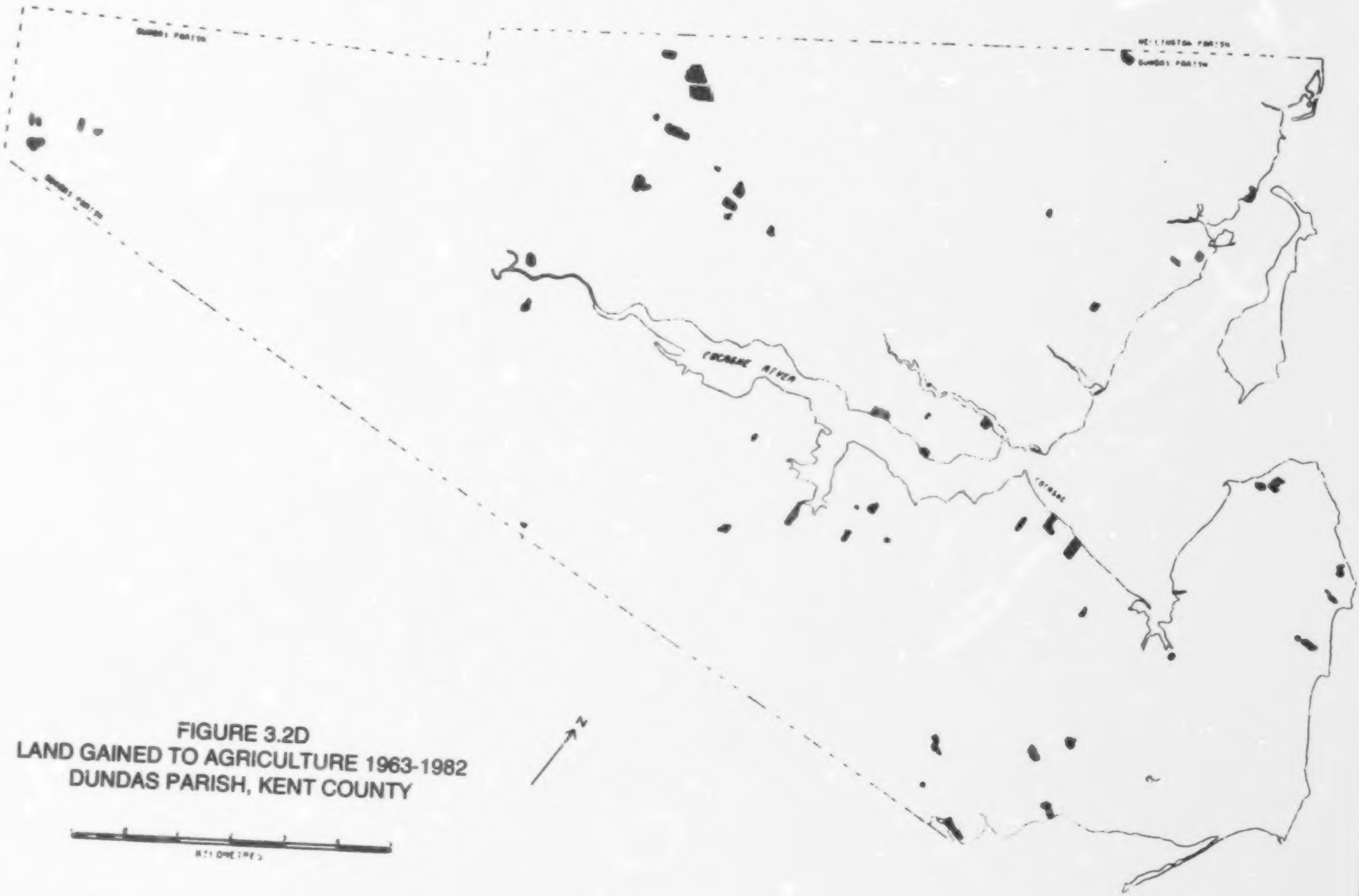
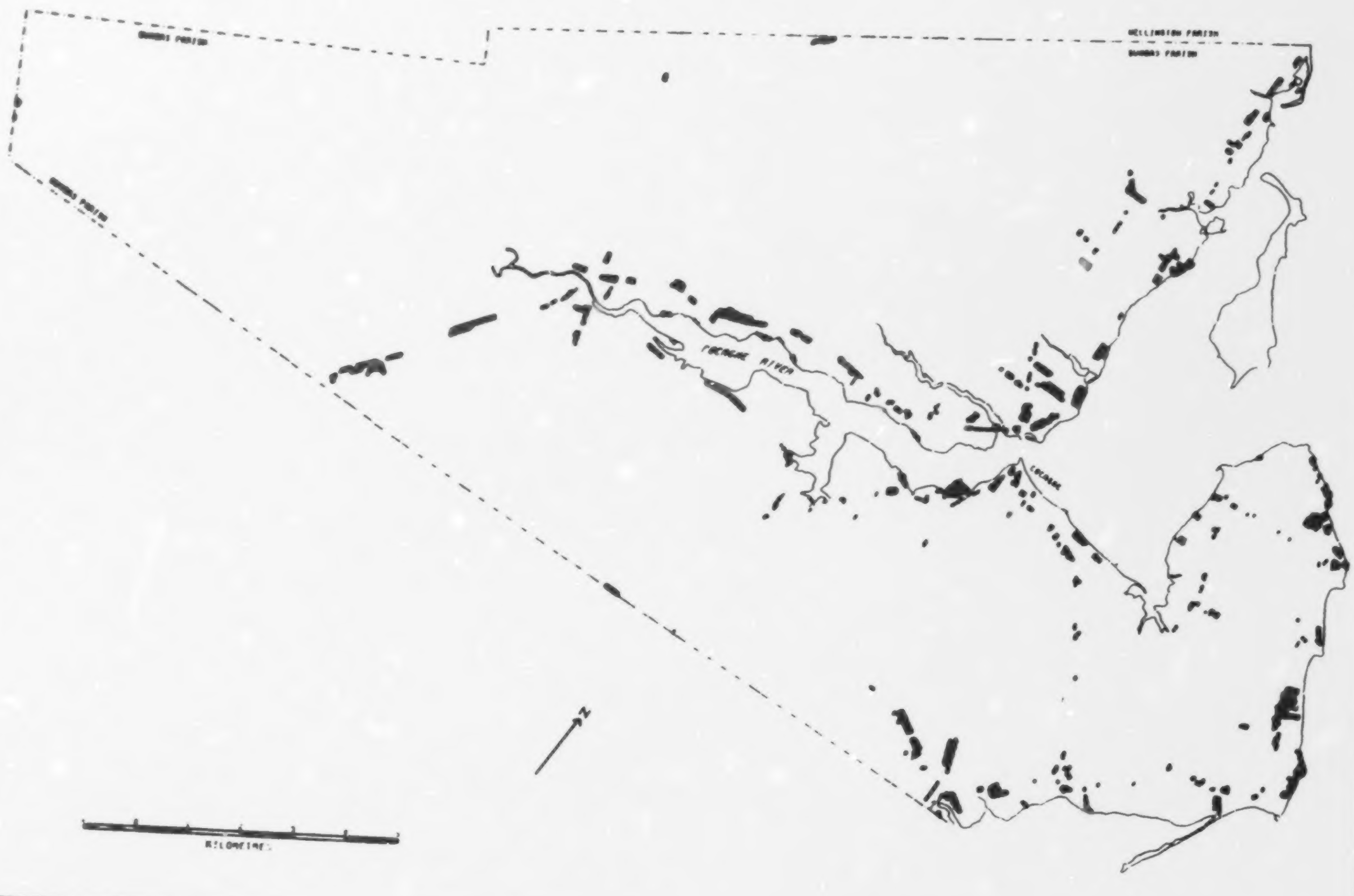

DUNDAS PARISH
DUNDAS PARISH
WELLINGTON PARISH
DUNDAS PARISH
COCAGNE RIVER
COCAGNE
N
KILOMETRES

FIGURE 3.2D
LAND GAINED TO AGRICULTURE 1963-1982
DUNDAS PARISH, KENT COUNTY

FIGURE 3.2E
LAND-USE CHANGE 1963-1982
AGRICULTURE TO URBAN OR RECREATION
DUNDAS PARISH, KENT COUNTY


DUNDAS PARISH
WELLINGTON PARISH
DUNDAS PARISH
DUNDAS PARISH
COCAGNE RIVER
COCAGNE
N
KILOMETRES

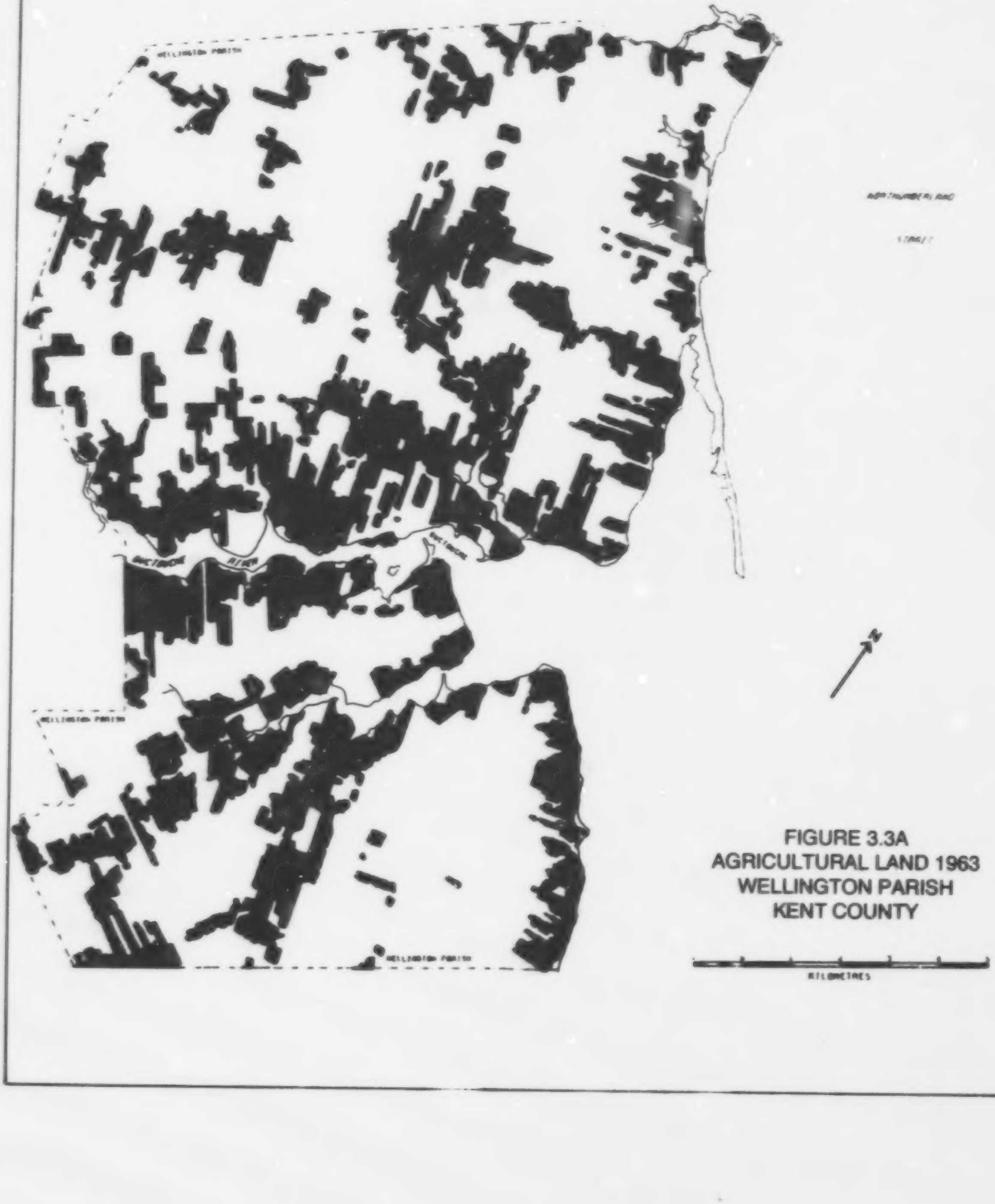

WELLINGTON PARISH
NORTHUMBERLAND STRAIT
BUCTOUCHE RIVER
BUCTOUCHE
N
WELLINGTON PARISH
WELLINGTON PARISH
KILOMETRES

FIGURE 3.3A
AGRICULTURAL LAND 1963
WELLINGTON PARISH
KENT COUNTY

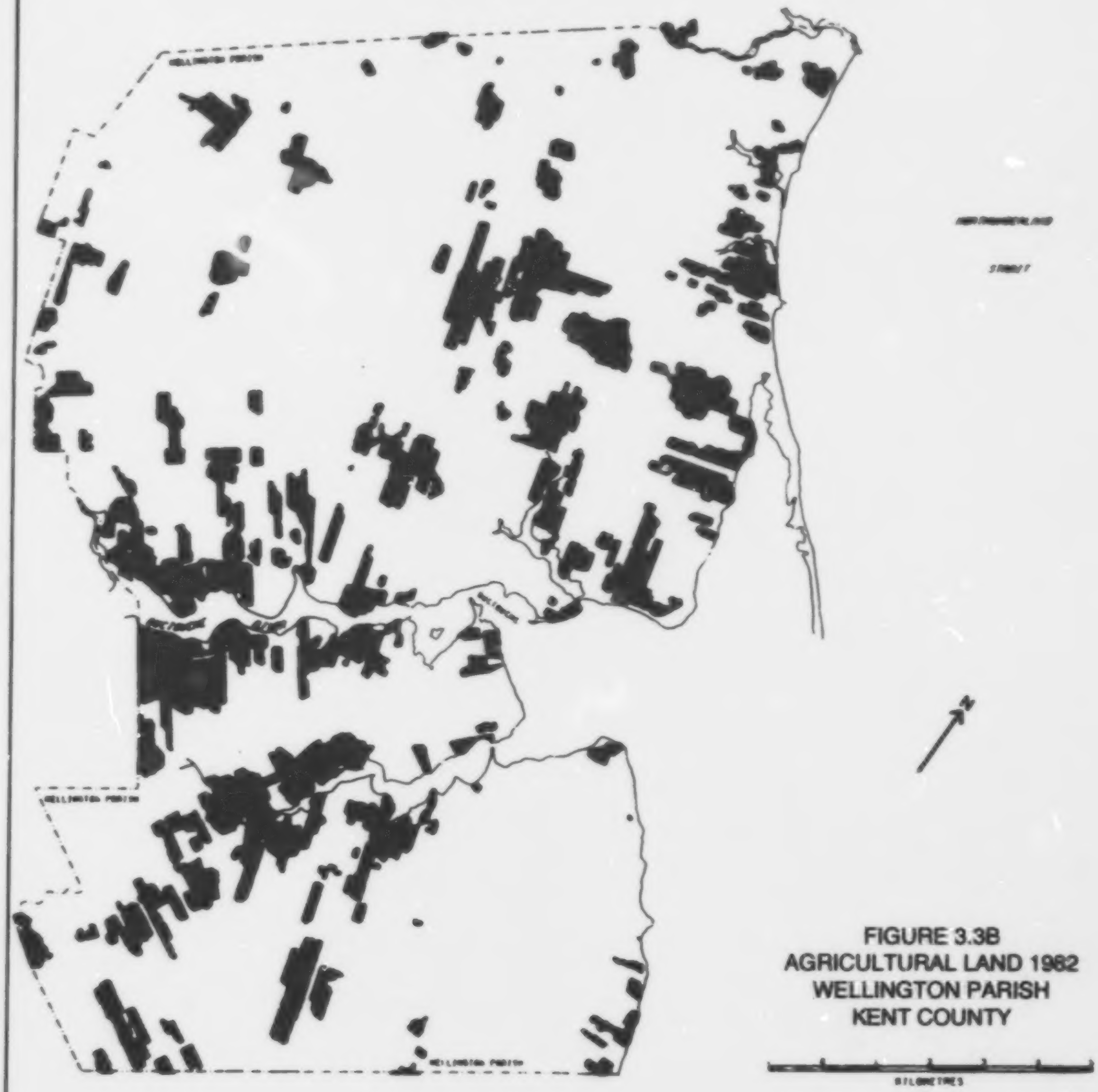

WELLINGTON PARISH
NORTHUMBERLAND
STRAIT
N
WELLINGTON PARISH
WELLINGTON PARISH
KILOMETRES

FIGURE 3.3B
AGRICULTURAL LAND 1982
WELLINGTON PARISH
KENT COUNTY

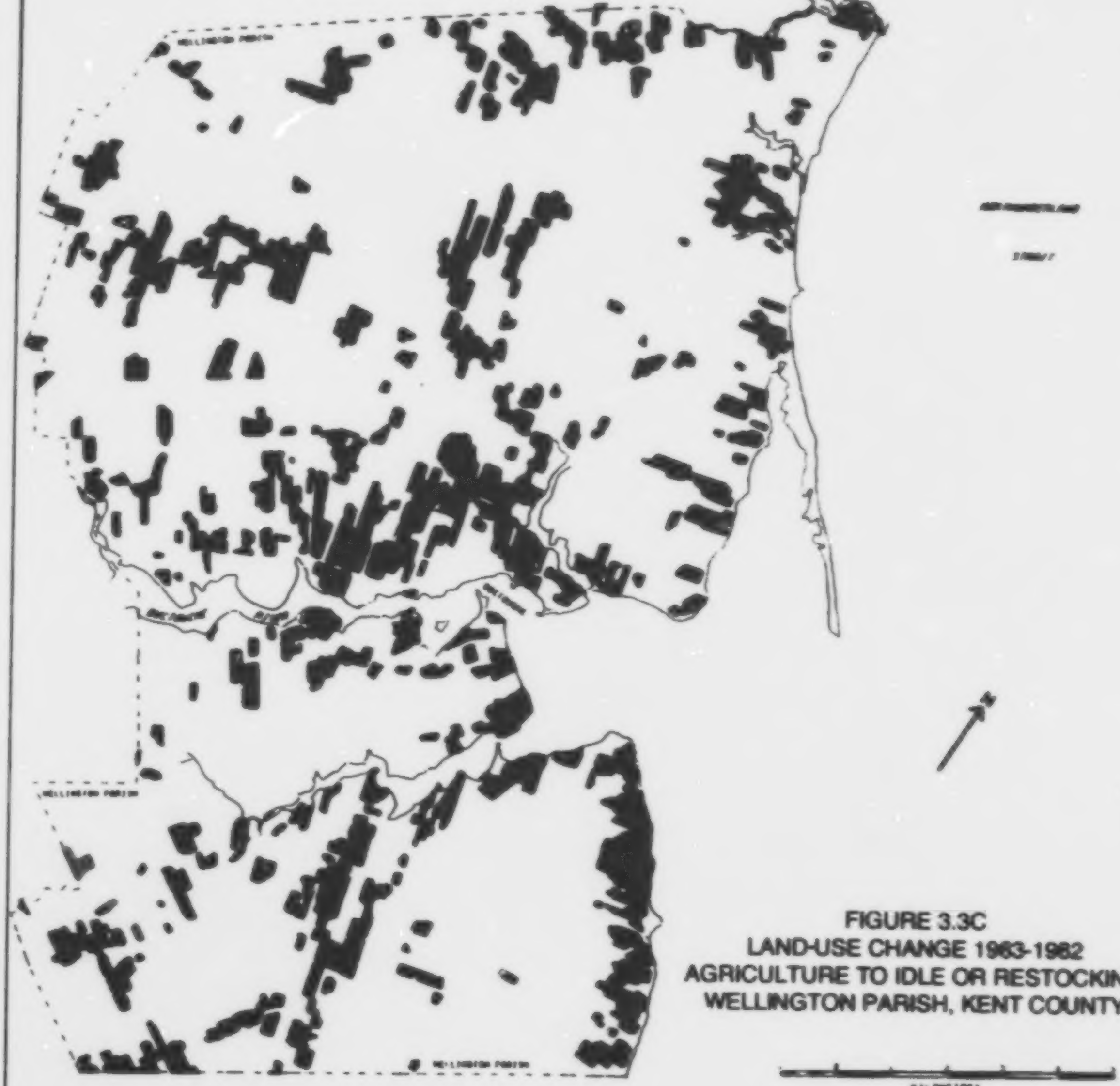

WELLINGTON PARISH
WELLINGTON PARISH
WELLINGTON PARISH
KILOMETRES

FIGURE 3.3C
LAND-USE CHANGE 1963-1982
AGRICULTURE TO IDLE OR RESTOCKING
WELLINGTON PARISH, KENT COUNTY

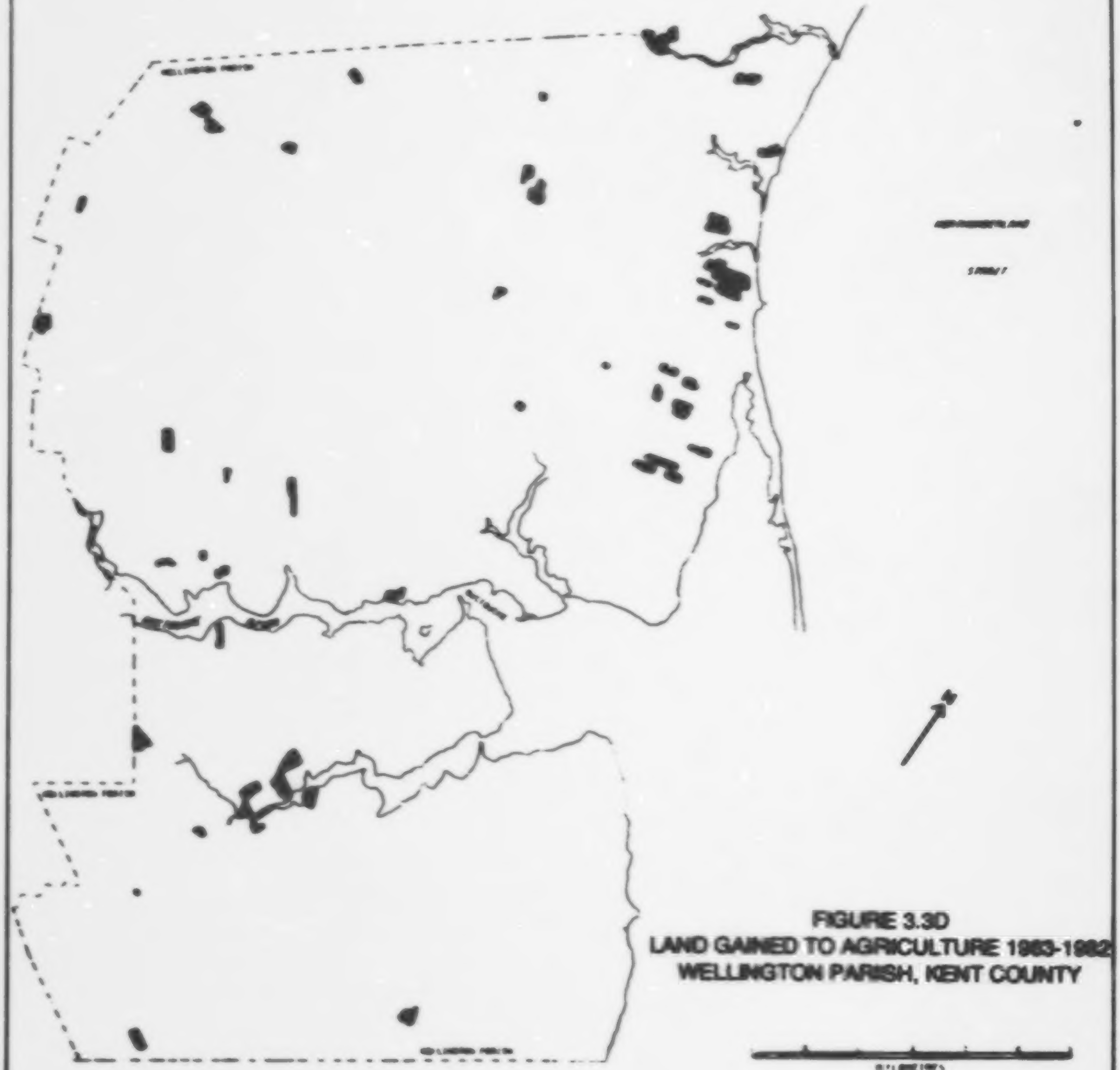


FIGURE 3.3D
LAND GAINED TO AGRICULTURE 1963-1982
WELLINGTON PARISH, KENT COUNTY

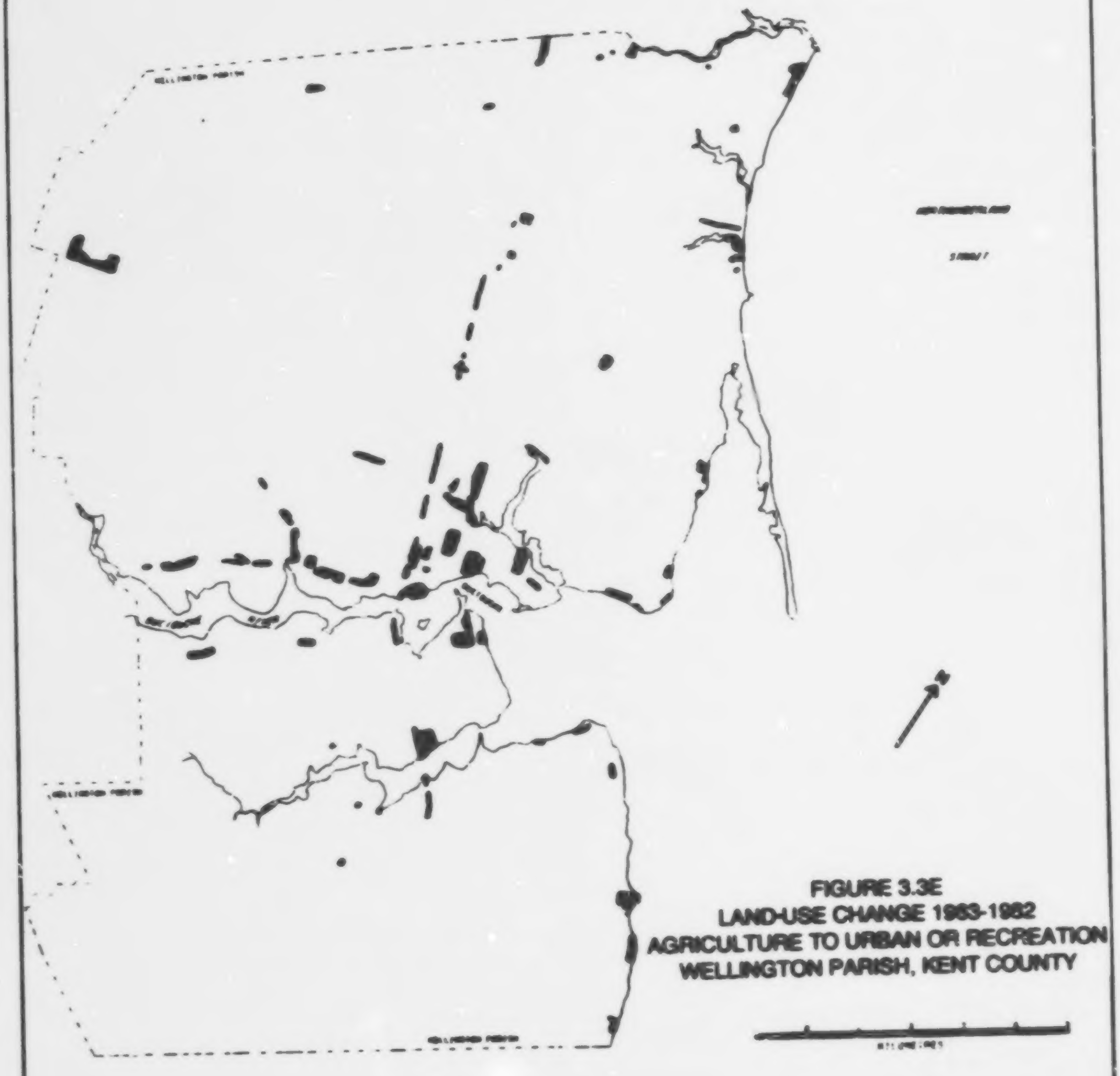


FIGURE 3.3E
LAND-USE CHANGE 1963-1982
AGRICULTURE TO URBAN OR RECREATION
WELLINGTON PARISH, KENT COUNTY

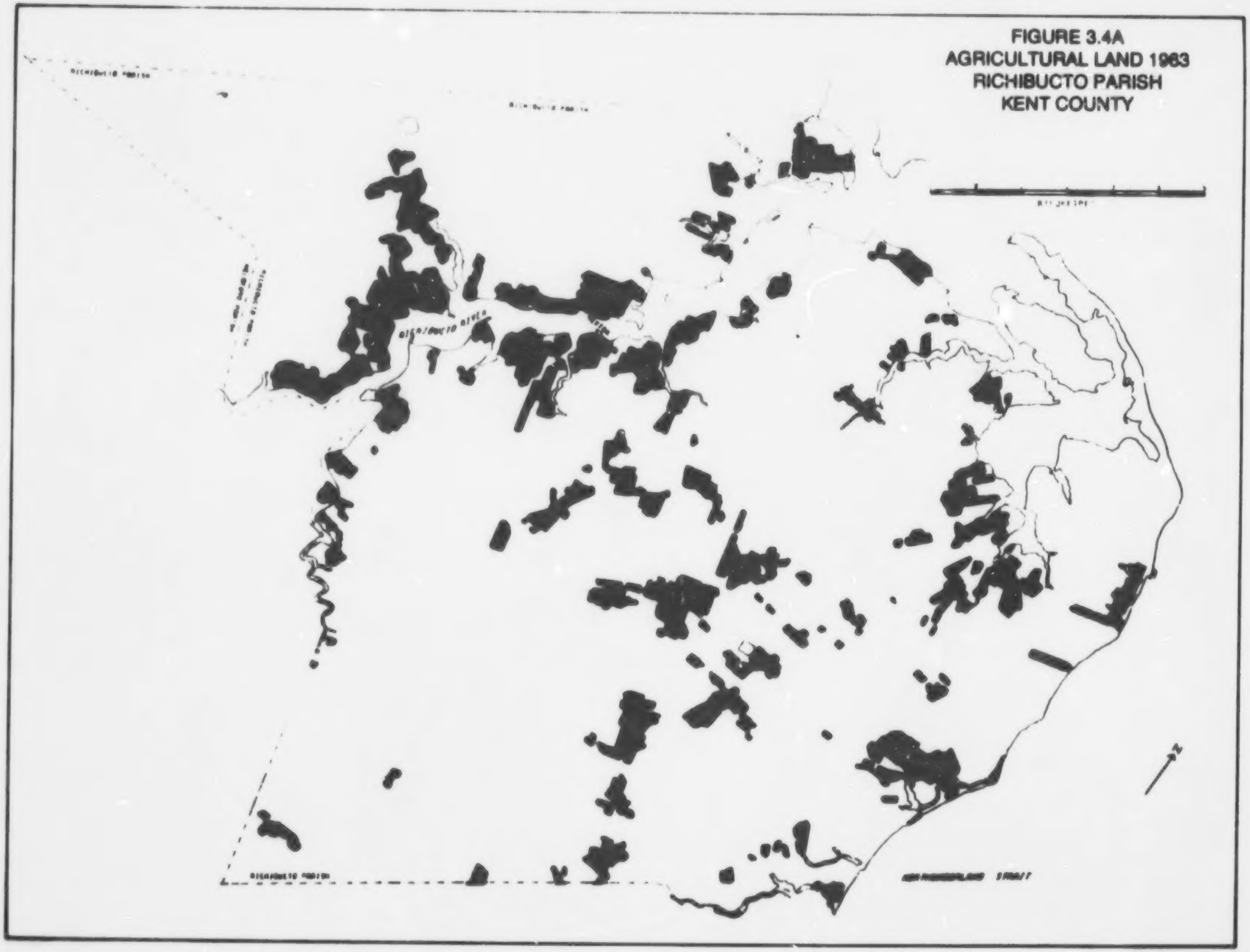


FIGURE 3.4A
AGRICULTURAL LAND 1963
RICHIBUCTO PARISH
KENT COUNTY

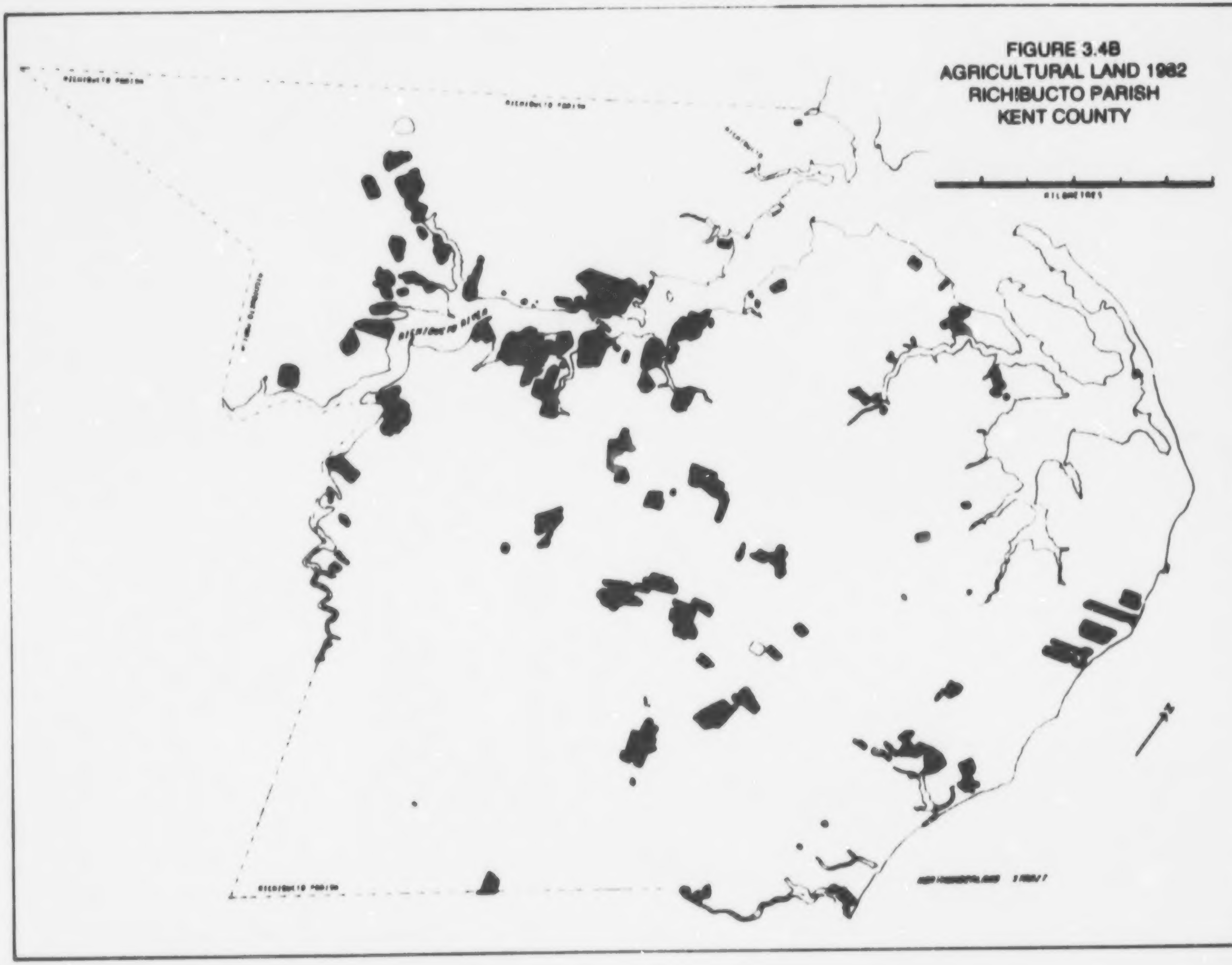
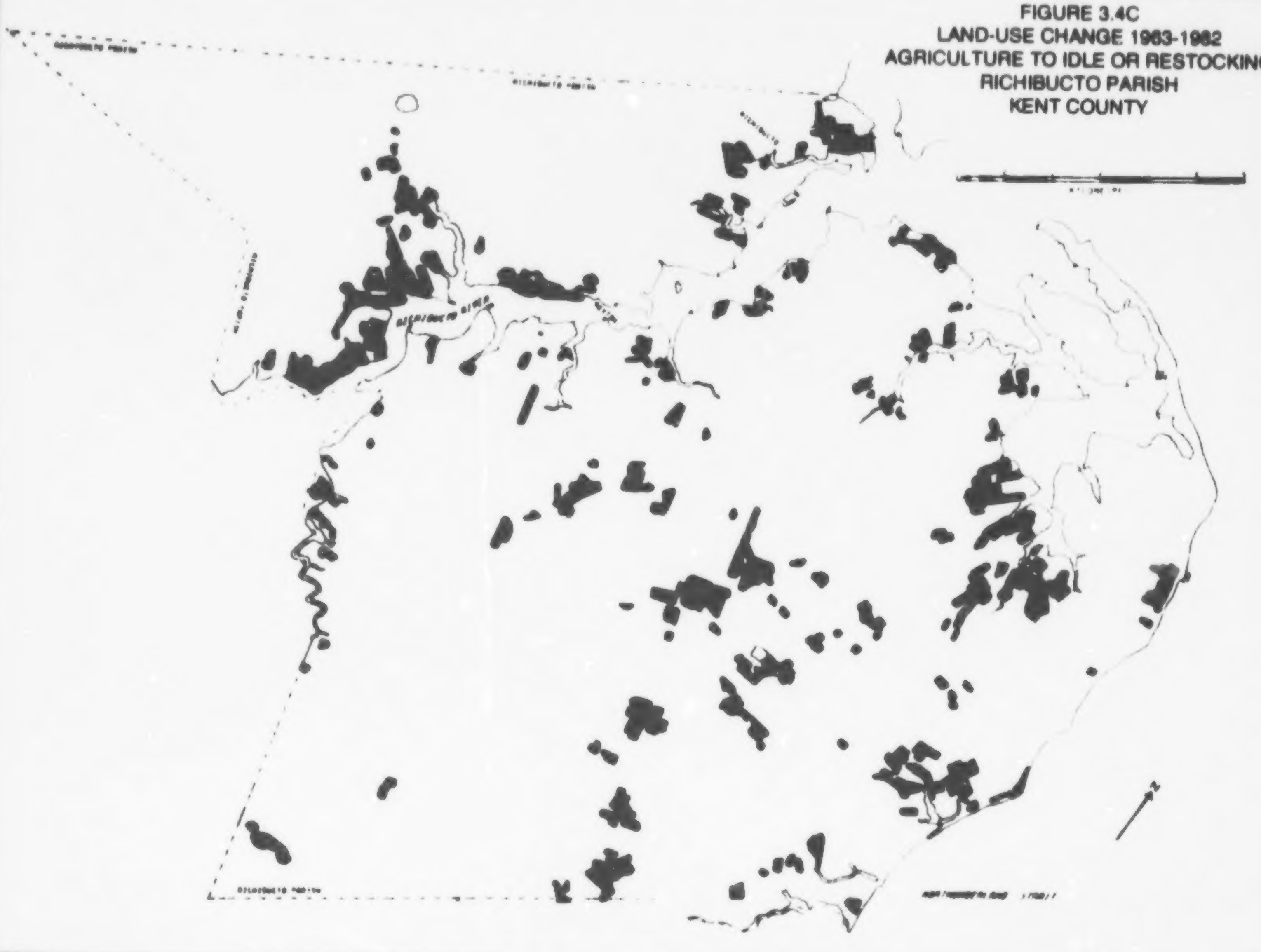


FIGURE 3.4B
AGRICULTURAL LAND 1982
RICHIBUCTO PARISH
KENT COUNTY

KILOMETRES
RICHIBUCTO PARISH
RICHIBUCTO RIVER
N

FIGURE 3.4C
LAND-USE CHANGE 1963-1982
AGRICULTURE TO IDLE OR RESTOCKING
RICHIBUCTO PARISH
KENT COUNTY



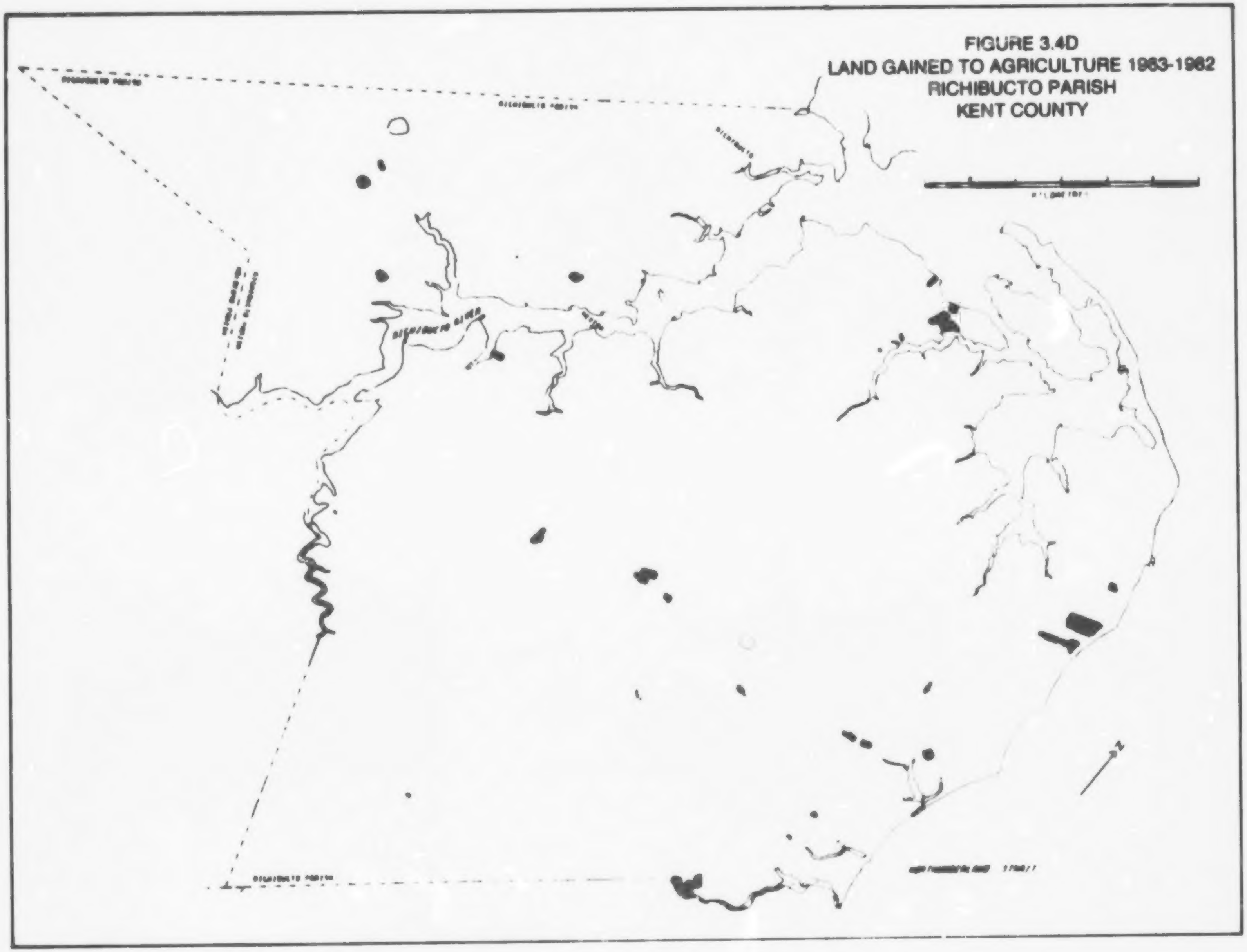
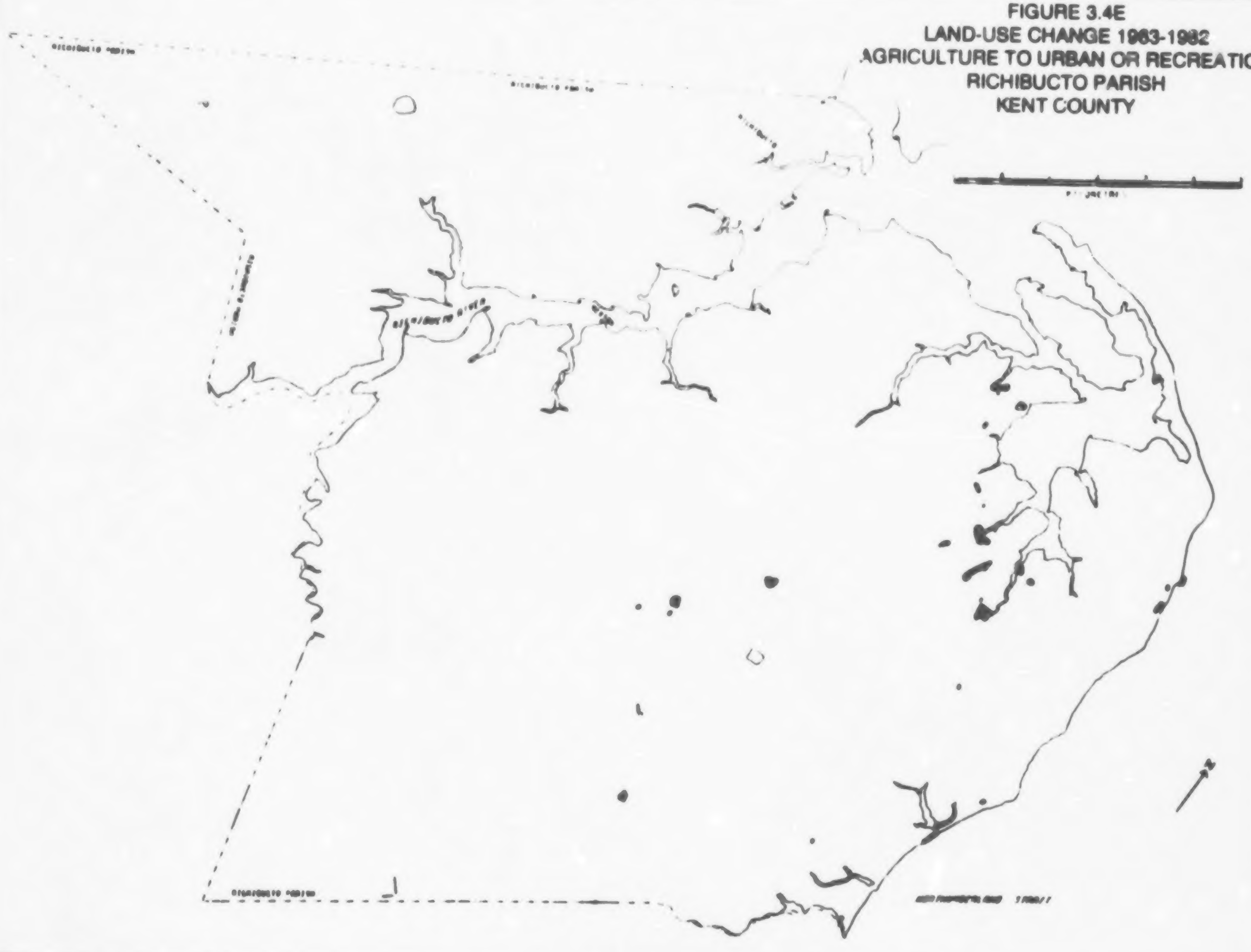


FIGURE 3.4D
LAND GAINED TO AGRICULTURE 1963-1982
RICHIBUCTO PARISH
KENT COUNTY

FIGURE 3.4E
LAND-USE CHANGE 1963-1982
AGRICULTURE TO URBAN OR RECREATION
RICHIBUCTO PARISH
KENT COUNTY



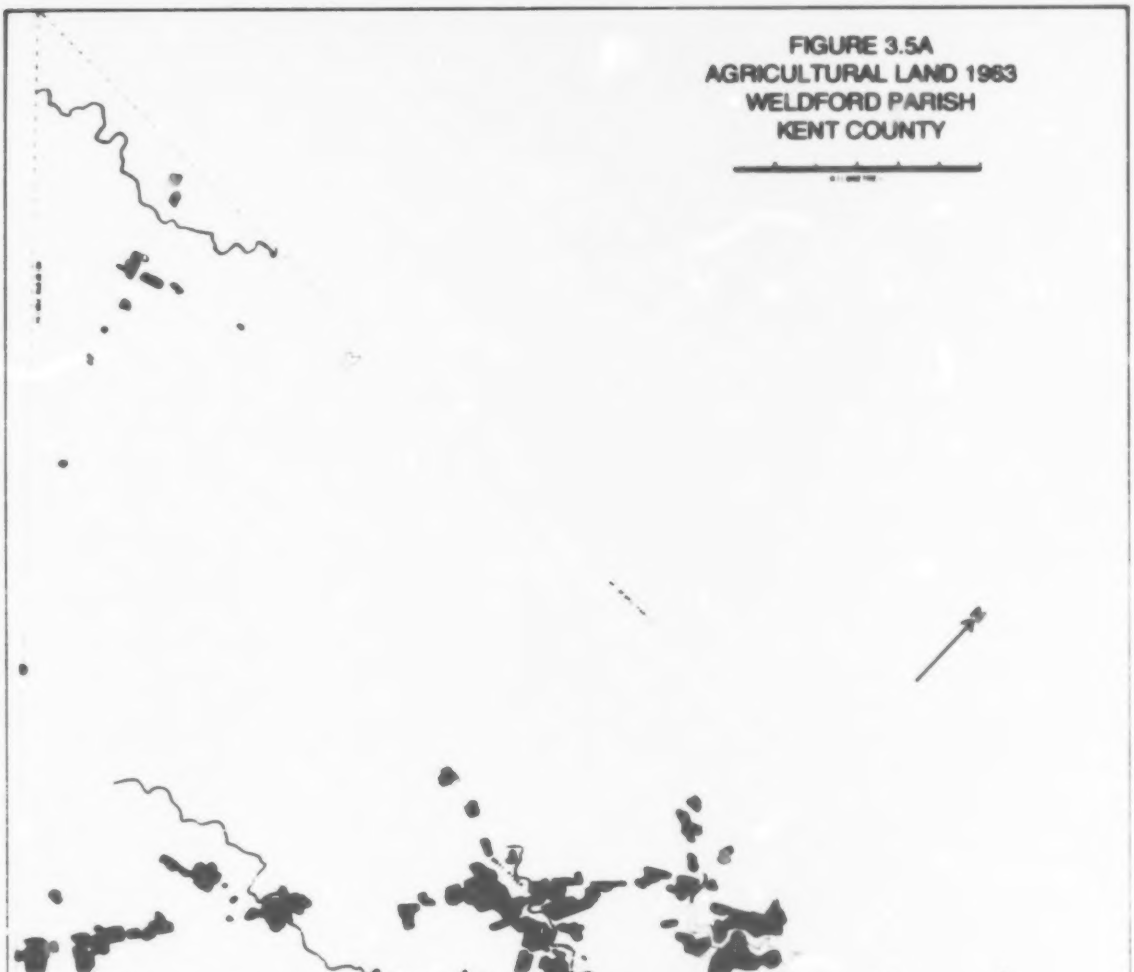


FIGURE 3.5A
AGRICULTURAL LAND 1963
WELDFORD PARISH
KENT COUNTY

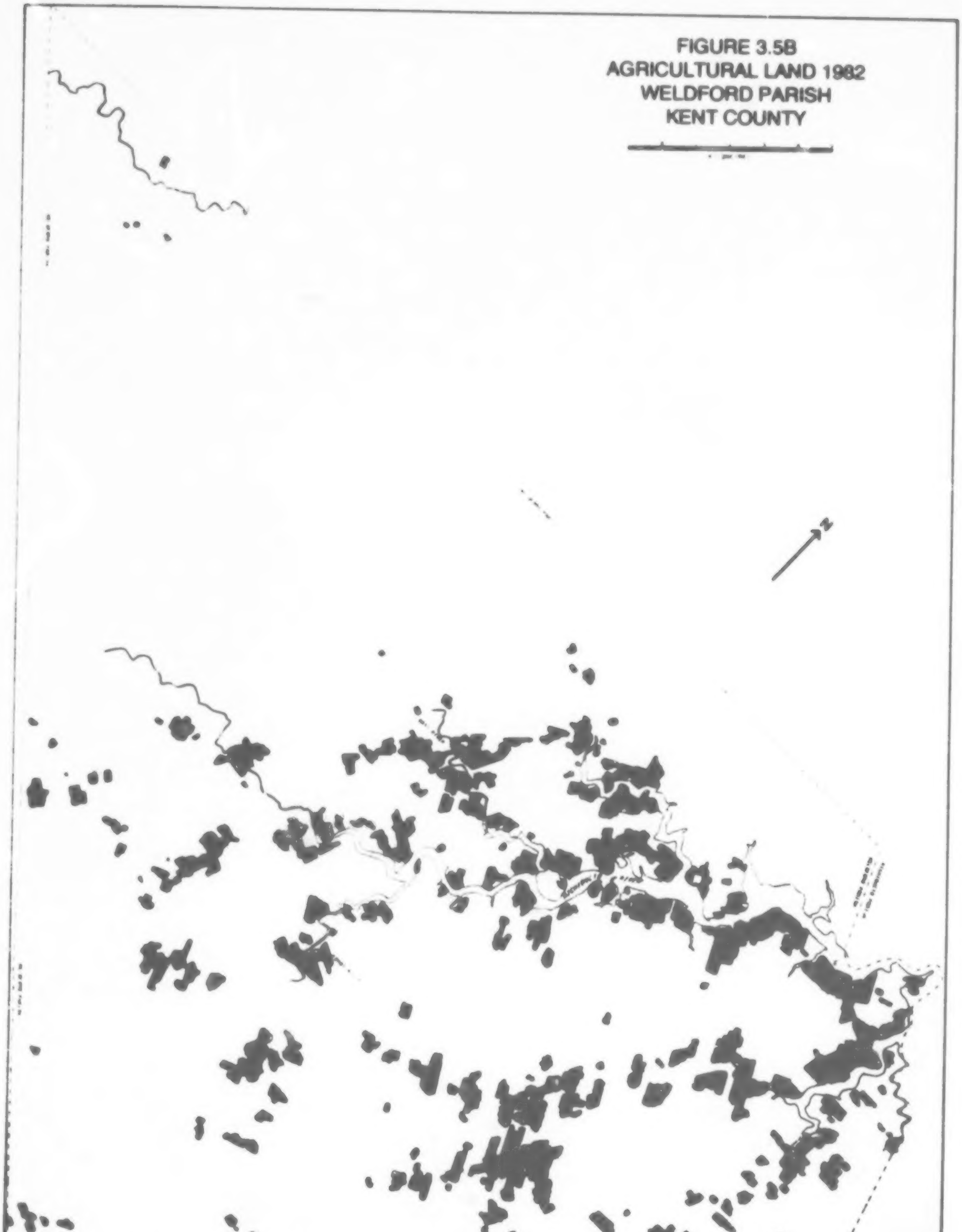


FIGURE 3.5B
AGRICULTURAL LAND 1982
WELDFORD PARISH
KENT COUNTY

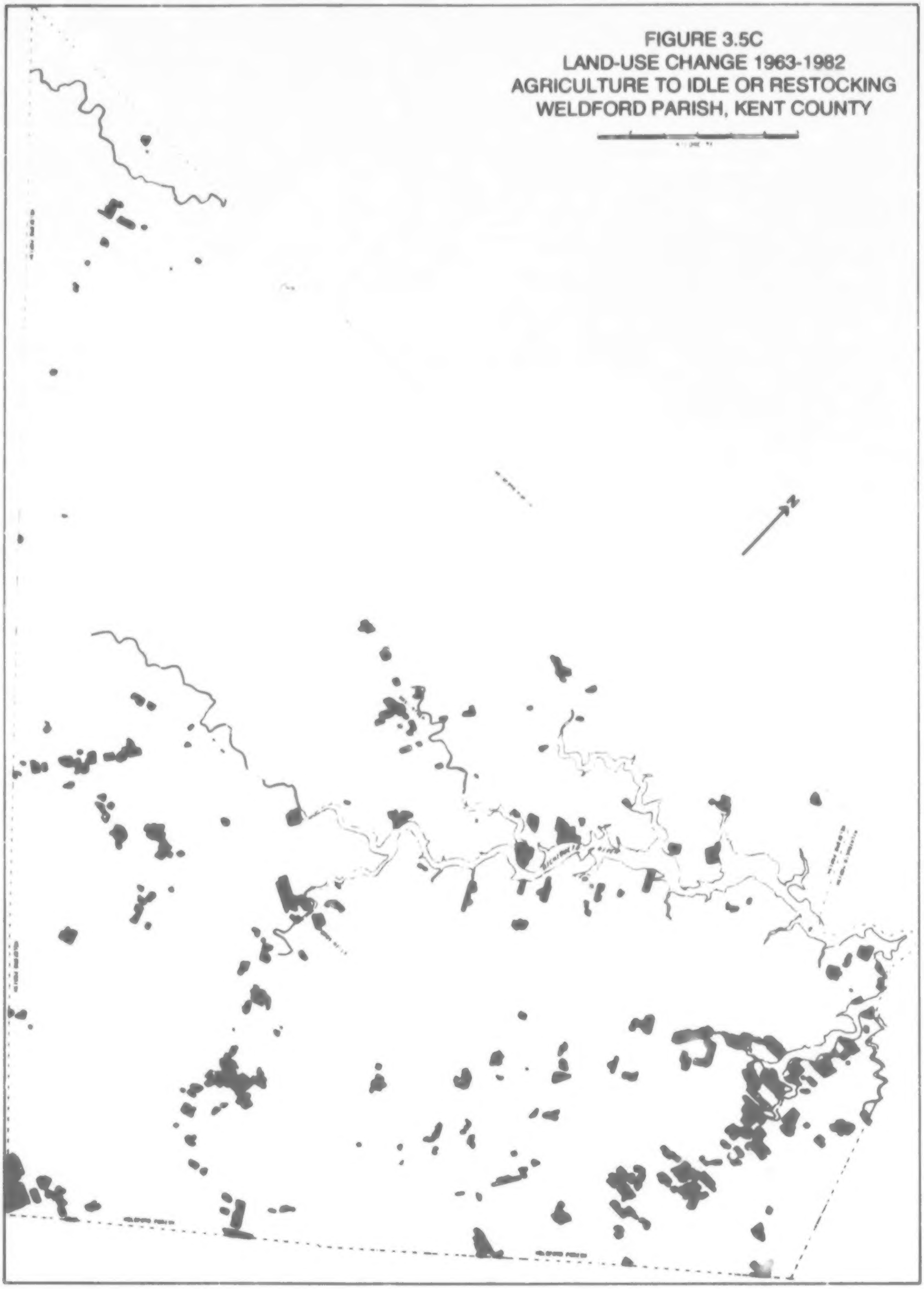


FIGURE 3.5C
LAND-USE CHANGE 1963-1982
AGRICULTURE TO IDLE OR RESTOCKING
WELDFORD PARISH, KENT COUNTY

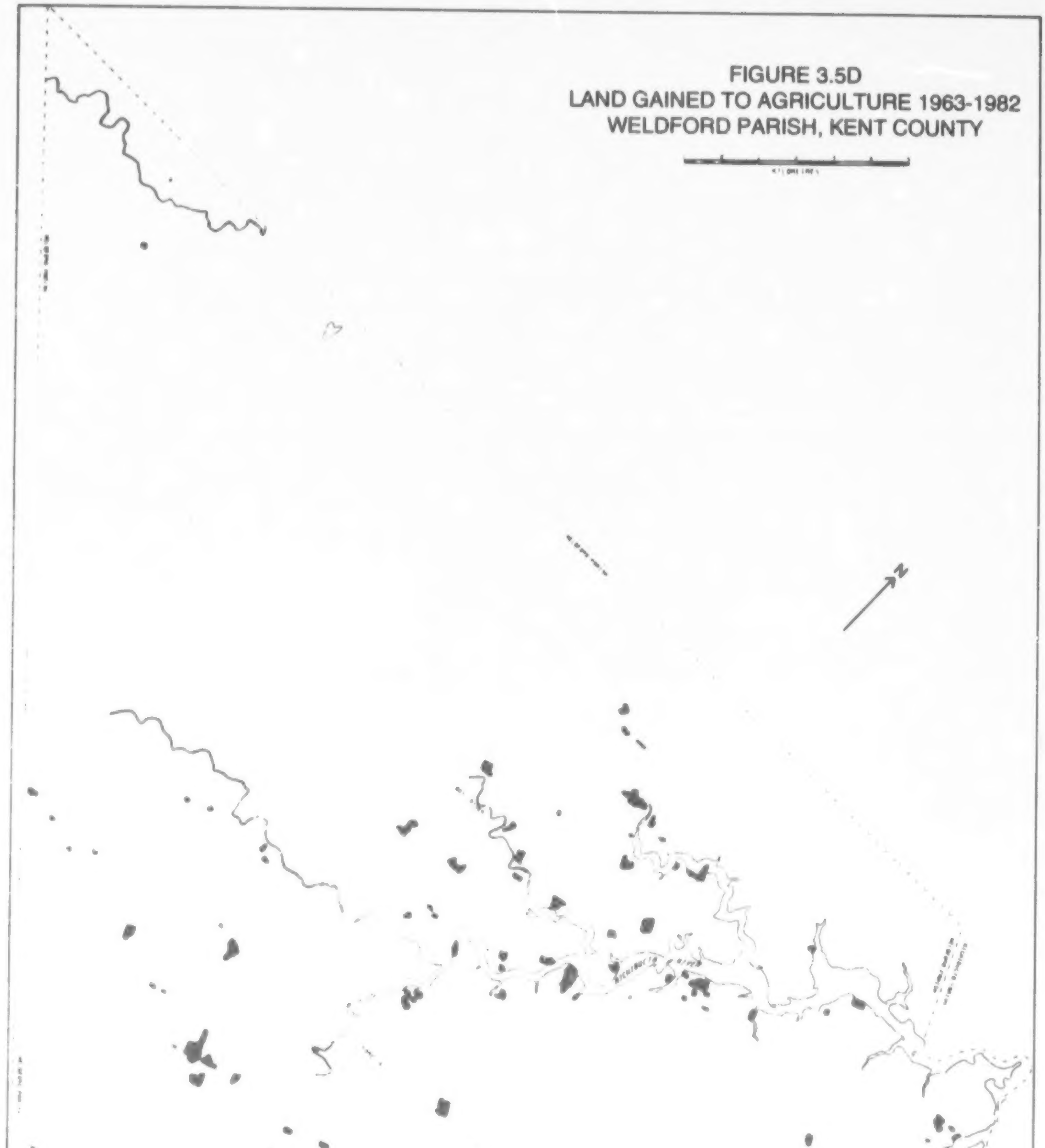


FIGURE 3.5D
LAND GAINED TO AGRICULTURE 1963-1982
WELDFORD PARISH, KENT COUNTY

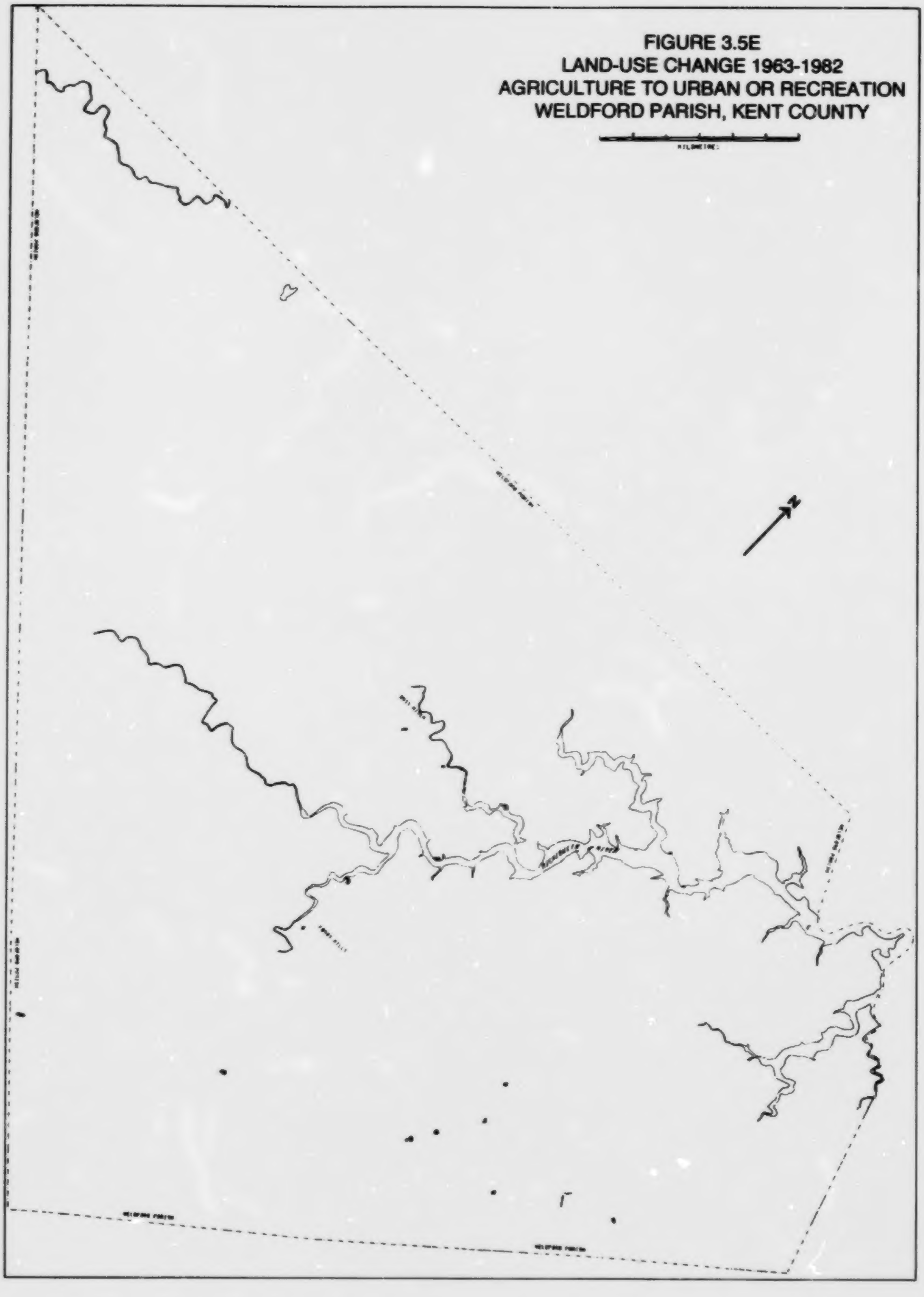


FIGURE 3.5E
LAND-USE CHANGE 1963-1982
AGRICULTURE TO URBAN OR RECREATION
WELDFORD PARISH, KENT COUNTY

KILOMETRES
N
RICHIBUCTO RIVER
WELDFORD PARISH
WELDFORD PARISH

TABLE 3.11

DESTINATION USE OF LAND LOST FROM EXTENSIVE AGRICULTURE

BY PARISH, KENT COUNTY, 1963-1982

Destination Use of Land Lost from Extensive Agriculture 1963-1982	-- Parish --							
	Dundas		Wellington		Richibucto		Weldford	
1982 Use	%	ha	%	ha	%	ha	%	ha
Intensive Agriculture	7.3	168	18.6	689	7.8	103	24.1	464
Idle	51.1	1,175	37.1	1,375	52.6	694	46.0	888
Restocking	27.2	625	38.8	1,438	32.3	427	28.6	551
Urban	10.4	238	5.2	193	5.8	77	0.9	18
Recreational	2.4	56	-	-	1.1	14	0.2	3
Other	1.6	36	0.4	15	0.4	5	0.3	5
Total	100.0	2,298	100.0	3,710	100.0	1,320	100.0	1,929

Source: Maritime Resource Management Service, Geo-Base System, Land-Use Survey.

purposes based on the findings from this survey. Almost three-quarters of the idle area in 1982 and almost 80 per cent of the reverting area was CLI class 4 land (Table 3.12). It will be recalled from Table 3.2 that about 30 per cent of Kent County is class 3 capability land, and almost 42 per cent is class 4. The land which has remained in farming use to 1982 is also predominantly Class 4 with smaller concentrations of both classes 3 and 5.*

The relatively high capability of land for agriculture as measured by scientific parameters is also shared by respondents to the questionnaire survey. Almost all (24 out of 27) respondents reported no unusable land on their holding, although thirteen reported land not actually being used in amounts ranging up to more than 40 hectares. The most frequent reason given for not using this land was because of physical limitations (8 responses) mostly to do with the land being too wet. Eight respondents said that the land had been used for agricultural purposes at some stage in the past. Fifteen respondents perceived their land as being good for agriculture, with a further 11 classifying the land as fair for agriculture. This perception was given largely without knowing precise capability classes; only two respondents knew the exact Canada Land Inventory classification of their land, although nine had actually heard of the existence of CLI for agriculture capability. (This perception is the reverse of survey results in rural Ontario and British Columbia when a similar question was posed - see McCuaig and Manning, 1982; and Manning and Eddy, 1978).

Loss of land from agriculture has largely been unrelated to either the location or the quality of land. The extent to which pockets of agriculture have survived in Kent County can be ascribed in part to a variety of other trends. Some of these can reasonably be expected to occur as natural outcomes of agricultural development over two decades in Eastern Canada, and they embrace such processes as farm enlargement, leasing of land, intensification of land use, and so on. These will be discussed in Chapter Four.

Recent examinations of the role played by physical characteristics in land abandonment in the Maritimes have not come to uniform conclusions. Crickmer (1981) studied the relationship of soil capability to farmland abandoned in various parts of Nova Scotia between 1953 and 1974. One of his conclusions was that:

> "Poor quality soils, rugged topography and distance to the nearest urban centre have affected the distribution of abandoned farmland, but cannot be considered as the major determinants controlling its location."

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*Quality measurements presented in Table 3.2 above show about 30 per cent of Kent County is class 3 capability. Data in this section indicates a bigger concentration of class 4 land largely at the expense of class 3 land. Soils information was taken from the most recent soil mapping available, published in draft form in 1982 by Agriculture Canada and the New Brunswick Department of Agriculture and Rural Development. Capability classes were also provided by soil scientists at the experimental station in Fredericton, and reflect an overall tightening of standards in assigning a particular soil type to a quality class.

Given the difference in the scale of soils mapping (1:50,000) and the working scale of the MRMS land-use survey for this study (1:10,000), this analysis of soil capability for agriculture should be treated with some caution.

TABLE 3.12

SELECTED LAND-USE CLASSES BY CAPABILITY FOR AGRICULTURE, FOUR PARISHES, KENT COUNTY, 1982

Selected Land Use 1982	Soil Capability Classes (a)											
	3		4		5		6		7		Total	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
Intensive Agriculture	102	5.1	1,679	84.6	190	9.6	11	0.5	3	0.1	1,985	100.0
Extensive Agriculture	531	6.2	6,760	79.0	1,227	14.3	38	0.4	--	---	8,556	100.0
Idle	154	3.0	3,819	73.7	1,123	21.7	85	1.6	--	---	5,182	100.0
Restocking	229	1.8	10,229	79.9	2,104	16.5	238	1.9	2	(b)	12,902	100.0
	1,016	3.6	22,487	78.8	4,644	16.3	372	1.3	5	(b)	28,525	100.0

Source: Maritime Resource Management Service, Geo-Base System, Land-Use Survey.

Notes: (a) Classified according to the Canada Land Inventory. Definitions appear as part of Appendix A.

(b) Less than 0.05 per cent.

Further, he states:

> "The role of physical factors in accounting for the spatial distribution of abandoned and recently cleared farmland varies according to the scale of observation. Physical determinants appear to operate most effectively at a regional level of observation and are considerably less significant at a more local level."

Crickmer also concludes that physical factors were much more of a determinant in the early stages of land abandonment and this, in turn, led to fragmentation of the agricultural land base at both the provincial scale and at the scale of the farm unit. At the provincial level, fragmentation into smaller farm units fostered the preservation of traditional methods, attitudes, and lifestyles which collectively contributed to further rural decline. At the level of the farm unit, the size of the farm suffered as, for example, a farmer loses his ability to carry out farm work due to age, ill health, or off-farm labour. The least productive and most distant fields are abandoned first.

A further influence identified by Crickmer relates to topography. Maritime topography tends to roll steeply, and whereas land cleared for farming would be suitably adapted to animal power, it is less suitable for machinery. The fragmentation of properties resulting from the earlier abandonment of marginal lands placed Maritimes farmers at a further competitive disadvantage.

Lamarche and Phipps (1982) have devised a technique to determine the hierarchy of constraints limiting the development of a number of agricultural systems in a study area of northern Kent County. (The study area chosen overlapped partially with that of the present project.) Using information theory, they state that existing data on soil association, texture, drainage, slope, climate and so on provide enough information "to determine the strength of the various constraints operating on the (agricultural) systems in the study area".

They conclude:

> "The analysis indicates that environmental characteristics alone explain 45% of the uncertainty associated with land-use systems in the area".

Their analysis further concludes that some 60 per cent of the abandoned land in the study area is no longer farmed because of environmental and quality constraints, of which the most important are drainage problems.

Although the Lamarche-Phipps project was largely indicative, in that it sought to identify the best location and concentrations of sites for certain types of agriculture (land-use systems), it does also conclude that physical factors have been instrumental in the process of farmland abandonment in northern Kent County. The degree to which this could have been corrected by the investment of capital in the farm operation is not addressed specifically and this, to a degree, explains the apparent disagreement between their work and the findings of the present study. In addition, their much more rigorous application of physical criteria is not possible using the more generalized data available from a soil survey mapped at a 1:50,000 scale.
Information from the present survey indicates that about one-quarter of idle land, and less

than one-fifth of restocking land, had low agricultural capability (CLI classes 5, 6 or 7). Incorporation of more detailed information on microclimate, proximity to the coast, surface texture and other physical variables would probably increase somewhat the proportions of land abandoned with serious physical constraints.

Lamarche and Phipps also state that some of the land presently under forest has better capability for agriculture than much of the abandoned, cleared or formerly cleared land. Measurements done in 1968 by the Canada Land Inventory substantiate this, even allowing for the generally looser standards which applied to land capability classification in the late 1960s (Table 3.13). By far the largest majority of land classed as forestry by the CLI in all of Kent County (almost 210,000 hectares, or about 85 per cent of the wooded area) was deemed to be in agricultural capability classes 3 or 4. The proportion remains similar if only land in the four parishes are considered.

Even allowing for a more rigid application of agricultural capability classes, it is evident that a considerable reserve of good farmland in Kent County was under trees in the late 1960s, and adding in the area of cleared land which has reverted to forestry since the 1960s would enhance this agricultural reserve. Nor is this reserve confined to the area of eastern Kent, usually considered as the obvious candidate for any putative agricultural expansion. It also extends into the western third of the County, usually regarded as wilderness.

It is difficult to summarize the effects of land quality or capability and their effects on rates of land abandonment in isolation from other factors such as locating with regard to markets or distribution centres, and survival of an adequate system of infrastructure. The present study indicates that, in the aggregate, farmland has been abandoned largely regardless of its capability for agriculture. It is also probable, however, that much more rigorous application of quality standards would reveal capability to be of some importance in the agricultural land abandonment process as the Lamarche and Phipps (1982) analysis tends to indicate. Finally, if both recently abandoned areas as well as original forested areas are counted, there remains a considerable reserve of land of reasonable quality for agricultural production within Kent County.

Land-Use Change in Kent County: A Summary

Net transfers of land between different land uses in the four parishes have largely involved a loss in the area being extensively used for farming. Only a very small proportion of this has actually become more intensively farmed. Instead, most of the land lost from hay and pasture has become idle or has restocked in trees. Although urban and recreational uses have become proportionately more important, the absolute areas involved in aggregate are still very small. These developed land uses, however, have significant impacts locally.

The greatly increased area of idle and reverting land in 1982 compared to 1963 has put Kent County quite firmly within the retreating margins of Canadian agriculture. Loss of agricultural land has been largely unrelated to either the location or the

TABLE 3.13

AGRICULTURAL CAPABILITY OF FORESTED LAND, FOUR PARISHES AND KENT COUNTY, 1968

Forested Land (1)		Agriculture Soil Capability Class					
		3	4	5	6	7	Total
Four Parishes	ha	36,020	29,233	8,104	180	2,143	75,680
	%	47.6	38.6	10.8	0.2	2.8	100.0
Remainder of Kent	ha	72,514	72,089	7,768	15	19,938	172,324
	%	42.1	41.9	4.4	0.0	11.6	100.0
Total Kent	ha	108,534	101,322	15,812	195	22,081	248,004
	%	43.8	40.9	6.4	0.0	8.9	100.0
Forested Land as % of Each Capability Class (Total of Kent)		61.6	58.7	74.4	20.4	38.7	

Source: Lands Directorate, Environment Canada, Canada Land Data Systems Division. Unpublished.

Note: (1) As classified by Canada Land Inventory in 1968. Total forested area in this table for the four parishes will not coincide with total forested area in Tables 3.6 and 3.7 because the CLI adopted more land-use classes.

quality of land. The extent to which pockets of agriculture have survived can be ascribed in part to a variety of other developments in agriculture such as farm enlargement, leasing of land, intensification of land use, and so on.

The experience of rural Kent County since the 1950s and 1960s is an example of the wider experience of rural land-use change in many parts of Atlantic Canada. Decline of agriculture has been all but absolute, and the landscape of the 1980s reflects this in the form of idle fields, or fields in the process of reverting to woodland. Only slight concentrations of agricultural land remain in areas where farming activity was formerly quite widespread.

Having established the magnitude of this agricultural decline, Chapter Four begins the task of exploring factors which have, in varying degree, contributed to that decline.

CHAPTER FOUR

FACTORS INFLUENCING RURAL CHANGE IN EASTERN NEW BRUNSWICK

The combination of factors which have influenced land-use change in Eastern New Brunswick is complex. Initially, several broad headings can be identified, but there is extensive overlap between most of these factors as they have entered individual decision-making processes which, in the aggregate, have resulted in extensive rural decline in the region. The impact of each factor also varies in intensity over time. Some are physical in nature, others involve the economics of farming or the aspirations of individuals. The list includes such influence as:

- the market for land, and the land market,
- profitability of agriculture,
- technology and mechanization,
- markets,
- skills and management,
- farm labour,
- infrastructure,
- alternative economic opportunities,
- changing expectations and attitudes,
- government programs and regulations.

This chapter attempts to gauge the relative importance of each of these factors and show how they have influenced land-use change in the study area. The information to support the extent to which each factor has influenced rural change is drawn extensively from the landholder interview survey and from conversations with knowledgeable personnel in Eastern New Brunswick. Types of knowledgeable personnel approached included provincial and federal agricultural officials, agricultural representatives, land-use planners, representatives of farmers' groups, and so on.

The main distinction between landholders and knowledgeable personnel is the means by which the information was gathered, whether by questionnaire or by less structured interview. In any event, there was a great deal of correspondence between thoughts and ideas elicited from both groups of people. Almost all respondents demonstrated a good understanding of the causes and consequences of rural change in Eastern New Brunswick either as it affected them personally or as it affected the larger rural community. The range of experience and insight into the rural economy over several decades was quite comprehensive.

The Market for Land and the Land Market

In the face of rising input costs, increased levels of mechanization, changing markets and fluctuating farm prices, one of the principal strategies followed by farmers throughout Canada has been to enlarge the land base of their farm operation in order to utilize their farm machinery and infrastructure more effectively, and remain competitive. Enlargement of farm operations in Kent County has occurred, both through purchase and leasing, but at a slower pace than the national average. The land market in Kent County poses barriers to farm expansion in the form of a fragmented pattern of land ownership and of a resistance to sell idle land; a reflection of traditional attitudes which value land ownership for its own sake. The sale of agricultural land for urban and recreational uses is increasing, but remains relatively minor. Each of these trends and problems is discussed in some depth.

Enlarging a farm operation in terms of land has been one of the widely accepted responses by farm operators to changing economic circumstances over much of Canada. Census data reveal that farms in Kent County in 1981 are bigger. The average area per farm in 1981 was 87 hectares compared to 65 hectares in 1961 and 46 hectares in 1951 (Table 3.4). The proportion of this farmland area which has been improved is also higher in 1981 (47 per cent) than in 1961 (35 per cent). In 1961, there was a skew in the distribution of farms towards smaller areas of improved land, with 72 per cent having less than 27 hectares in extent (Table 4.1). Although there is still a high proportion of farms with less than 27 hectares of improved land, slightly over half of all farms (50.3 per cent) had improved areas in excess of this amount by 1981.

Enlarge or go under has been the watchword for farmers in Kent County. By 1981, farms were larger, with more improved area per farm, but much fewer than in 1951. Indeed, census farms in the County declined by 89 per cent in number and 92 per cent in total area from 1951 to 1981. As further evidence, the 19 respondents in the landholder survey identified as commercial farmers managed (without necessarily owning) larger areas of land than the other survey respondents. The corollary of this appears to be that those who could not or did not enlarge their farm area severely limited their ability to survive as farmers.

There are two ways to increase the size of a farm: by purchase and by lease. The latter of these may include a variety of informal agreements to use land. Among the 27 landholders surveyed, eight respondents had bought additional land for agricultural purposes since 1976, with the purchases ranging in size from 8 to 81 hectares. Another four respondents had been approached to sell property to commercial farmers, altogether indicating a reasonably active land market and level of farmland demand in Kent County recently. Among those surveyed, the land rental market has also shown recent activity. Five respondents mentioned leasing in more land over the same period, while three others said they had leased land out since 1976.

The years since 1961 have seen a relative increase in the incidence of leasing in Kent County (Table 4.2A). In 1961 only a very small portion of total farmland area was leased (less than 3 per cent), but twenty years later, the leased area represented over 16 per cent of all farmland in the County. The landholder survey provided a further indication of the prevalence of leasing by farmers in the County. Of the 19 commercial farm operators identified in the survey, fully 16 leased additional land from others, and three of the eight non-farmers in the survey leased land out to others. The commercial farmers who leased in land had arrangements on areas varying from 3.2 hectares to 212 hectares.

Informal rental arrangements were common among the landholders surveyed. Although formal written leases governed arrangements on five of the leases, seven were informal with three others a combination of formal and informal.

TABLE 4.1

FARMS CLASSIFIED BY IMPROVED AREA, KENT COUNTY 1961 AND 1981

	1961		1981	
	Number	%	Number	%
less than 1 hectare	28	2.5	20	7.9
1 to 3 hectares	46	4.2	18	7.1
4 to 27 hectares	719	65.2	87	34.5
28 to 52 hectares	251	22.8	61	24.2
53 to 72 hectares	34	3.1	28	11.1
73 to 97 hectares	12	1.1	15	5.9
98 to 161 hectares	12	1.1	20	7.9
162 hectares or more	1	0.1	3	1.2
Total	1,103	100.0	252	100.0

Source: Census of Agriculture.

Note: Size classes converted and generalized from original figures in acres.

TABLE 4.2 A

TENURE OF FARMLAND, ATLANTIC CANADA AND KENT COUNTY 1961 AND 1981

	1961		1981	
	Atlantic Canada	Kent County	Atlantic Canada	Kent County
		- per cent -		
Total area owned	96.2	97.1	84.0	83.6
Total area rented	3.8	2.9	16.0	16.4

Source: Census of Agriculture

TABLE 4.2 B

CHARACTERISTICS OF LEASED LAND, LANDHOLDER SURVEY, KENT COUNTY, 1982

	Total Area (Numbers)	Cleared Area (Numbers)
Less than 10 ha	3	3
10 to 20 ha	2	2
21 to 40 ha	5	5
41 to 101 ha	3	5
102 ha and more	3	1
Total	16	16

Source: Maritime Resource Management Service, Landholder Survey.

Note: Area classes derived from answers in acres, corresponding to less than 24 acres, 25 to 49 acres, 50 to 99 acres, 100 to 249 acres, and 300 acres or more.

The informal leases included a variety of handshake arrangements which include, for example, supplying produce to the landholder, or keeping the growth of weeds and small trees back. Even where written leases had been signed, money does not necessarily change hands as rent payment. Frequently, maintenance of the land with some operating and capital improvements understood on the part of the farmer are sufficient to secure use of the land.

Despite the prevalence of land rental in Kent County, there are ambivalent attitudes towards leasing. In general, farmers would prefer to buy land and use it as collateral against capital improvements, land-based or otherwise. Credit managers also prefer this for reasons which are self-evident and couched in terms of securing loans. There are then incentives to improve that land to provide a future stream of income to the farmer and his family. These incentives are much less apparent if a farmer works leased land unless there is an agreement to buy at some stage. On the other hand, there is also the undoubted benefit in an area of extensive land abandonment of leasing as a means to prevent reversion to woodland. Presumably, there will be some effort on the part of the farmer to maintain a certain minimum quality of land for his own use (either for crops or grazing), and the degradation of the land is arrested or delayed. Nevertheless, short-term leases or informal arrangements prevent long-term improvements to the land (e.g., tile drainage), because farm operators are uncertain of the length of time they will be able to use the land and benefit from the improvement. Consequently, they are reluctant to make large, long-term investments in leased property.

Commercial farmers in Kent County also experienced difficulties in locating leasable parcels of land adjacent to their own operation. One example of this came to light in discussion with potato farmers near Shediac, just to the south of the study area. Rotation for potatoes is on average three years, which means to sustain output from a stable area in any given year requires three times that single year's crop area. Usually, the only available area in aggregate is fragmented into as many as 10 or 12 parcels with the furthest several miles away from storage and grading facilities at the farm headquarters. During harvest especially, farmers spend a great deal of time transporting potatoes from more distant fields to central storage. As likely as not, these distant leased fields have been cultivated on a handshake basis, conceivably putting the grower's entire investment of capital and labour at risk should the landholder decide to renege on the informal agreement.

Although this example refers to potato farmers, it probably could extend to other types of agricultural enterprise all over the Maritimes where land tenure, whether leasing or owning, has become highly fragmented and somewhat chaotic after several centuries of inheritance, in which the family property was often divided among the children into successively smaller parcels (see Jackson and Maxwell, 1971).

The increased incidence of leasing farmland in Kent County has resulted from a sluggish market for land. Despite the uncertainty and the problems with investing in improvements, farmers who wished to enlarge their operations have often had no alternative but to lease the area required. Mainly, this results from the fact that people who have left Kent County to work elsewhere have held on to the land they left behind. There are several reasons for this reluctance to sell. In the first place, at time of departure, the generally uneconomic position of agriculture in the area did not allow neighbouring farmers to make any offer to purchase land which became vacant by emigration. In the second place, as the means for farmers to buy vacant land have become available (through improved credit facilities, for example), the necessity of selling the land has been reduced as the people who emigrated began to make plans to retire to their family's homestead.

The land represents the family inheritance, and propensity to sell, as a result, has been weak. The preference for retaining land ownership in Kent County was indicated in the landholder survey. Seventeen of the twenty-seven respondents first acquired land in Kent County before 1960, including four before World War Two. Only five had first acquired land since 1970, emphasizing once again the Maritime trait of holding on to title to property even if you don't work that land. In circumstances such as this, leasing is the only alternative to direct purchase.

And the reluctance to sell land, which necessitates leasing, is not expected to diminish. Several respondents to the landholder survey remarked on a range of land problems foreseen in the next five years. These included land being tied up in estates, land being lost to an expanded rate of urban development, and too much tradition in the area that implicitly indicated a degree of intertia which hindered the workings of the land market. Given this set of circumstances, there are pressures which can very easily cause a massive change in the use of land from active agriculture to idle or restocking (7,173 ha from extensive agriculture to idle or restocking in the four parishes over 20 years), as people emigrate, but retain their landholdings. Only where there has been a willingness on the part of the owner to lease land to active neighbouring farmers has there been any hope of retaining cleared fields in a state amenable to agricultural pursuits.

Such firmly ingrained attitudes to land-ownership are difficult to change over periods of less than one or two generations. The general perception of agriculture in Eastern New Brunswick has not encouraged transfers of land to working farmers. For example, two of the six part-time farmers interviewed remarked that the reason they were not farming full-time was that the size of their farm would not allow this.

Transfer of land within families has also been affected by traditional attitudes. Title usually remains with the father until death, or at least quite an advanced age. Members of the next generation have usually been quite anxious to carry on the family farm, and have also usually been willing to try new ideas of their own in efforts to innovate and diversify the farm operation. In many instances, however, they were denied title to the land until they were in their 50s or 60s, an age when youthful spirits of innovation and experimentation have become somewhat subdued. Rather than face this prospect, many young people left farming completely. After the father stopped farming, the land stood a good chance of being lost to agriculture with no heirs willing, or able, to carry on.

Nationwide, the cost of farms, both land and buildings, has posed a significant, if not insurmountable, barrier to those desiring to enter farming or to expand their farmland holdings. For Canada as a whole, the value of farmland and buildings per hectare increased 417 per cent from 1961 to 1976, over four times as rapid as the rise in the Consumer Price Index over the same period (Manning, McCuaig and Lacoste, 1979). The value per hectare of farms in Kent County escalated rapidly from 1961 to 1976 (523 per cent) even in comparison to the provincial (391 per cent) and national average (417 per cent). Nevertheless, on a national basis, farmland values in Kent County have remained a bargain at slightly over $400 per hectare versus $500 per hectare for the province as a whole and nearly $650 per hectare nationwide in 1976. Still, these relatively modest land prices posed a significant financial obstacle to many Kent County farmers, given the modest farm incomes.

What has happened to land values in the County since 1976? The landholders surveyed had varied opinions, but with a general consensus towards an upwards movement in land values. Eleven of the twenty-seven respondents thought that the value of their land had increased a little since 1976, nine thought the value was the same, and four thought the value was up a lot. Eight respondents put the value of their land in 1982 at about $2,500 per hectare or more, and a further five estimated in the range of $1,235-$2,500 per hectare. These rather high land values reflect the large number of commercial farmers among those surveyed. Figures towards the higher end of the total range, in particular, come from respondents running quite highly specialized farms, and the estimated value, therefore, would incorporate a fair bit of capitalization in the form of machinery and buildings.

Competition for farmland usually is most intense from urban-related uses such as sub-division, industrial expansion, road-building, or recreational developments. In reality, agriculture as a land use over large parts of Eastern New Brunswick has rarely been able to withstand competition from other land uses. The fact that this competition has been quite limited in nature seems to indicate that competition for land has not been a prime cause underlying land-use change. Indeed, urban and recreational uses only showed a net gain of 934 hectares over the twenty-year period, which is small in comparison to the area of agricultural land idled and restocked to bush and trees.

The land market for urban and recreational properties has been relatively active in Kent County, but for smaller properties in limited areas along the shoreline and major roads. As an indication, eight of the twenty-seven survey respondents had been approached to sell their property over the past five years, and four of these had received some kind of proposition concerning sub-division. In addition, four respondents had sold land for building since 1976. In particular, there have been some pressures in the south of the area, for sub-division, and there has been a sustained demand for shoreline lots along the Northumberland Strait for recreational properties. Much of this demand emanates from the Moncton market. Apart from these pressures, the demand for residential development has been no more than local population and limited economic circumstances have permitted.

Nevertheless, sub-division in rural areas, whether for permanent or temporary (vacation) homes, can have a larger land-use effect than the area actually occupied by houses or cottages. Usually, a "shadow" is cast by a sub-division which strongly affects more traditional rural enterprises such as agriculture. Persistent problems of trespass and vandalism on the part of non-agricultural residents affect crop and livestock rearing. Farmers may even be subject to municipal regulation which restricts machine operation or certain kinds of farm enterprise or work, on the grounds they will offend neighbouring residents.* Although these pressures and conflicts have been less in Eastern New Brunswick than elsewhere in Canada, there have been localized effects in the southern part of Kent County which have tended to further erode the competitive position of farming. Certain types of livestock operation (particularly intensive hog and poultry rearing) have been pressured to relocate away from concentrations of homes.

What are the future prospects for farmland availability in Kent County? The next few years may see a mild surge in land market activity. Traditional pressures for residential sub-division will, in all likelihood, be maintained. A new telecommunications factory at Buctouche is likely to enhance this activity locally, once it is working. Up to 1,000 new jobs are expected, and the extra income will allow many families the leeway to buy, or to build, a larger home. A fair amount of expansion can be expected in the Moncton area which will mean pressures for rural sub-division and shoreline recreational development over much of the southern part of Eastern New Brunswick.

The pace of activity among rural, resource-based economic pursuits is also likely to increase. Specialization with high value crops has allowed quite a few farmers to afford to buy more land; six respondents mentioned that they wished to expand the area of their holding over the next five years for agricultural purposes. This specialization has also meant more intensive use of available land in farms, as land in intensive agriculture rose from 1019 to 1985 hectares from 1963 to 1982, an increase of 966 hectares (Table 3.9). Location of this more intensively farmed land is reasonably widespread. Tobacco enterprises have tended to cluster between Buctouche and Richibucto near the coast; the ameliorating influence of the Northumberland Strait on localized climate is an important part of this location decision. Certain cole crops on the other hand, such as Brussels sprouts, derive a good deal of their quality and palatability from crisp, late season weather and have, as a consequence, been grown further inland. Christmas trees (both spruce and fir) are being grown wherever sufficiently large blocks of cleared land are located in relative proximity, to allow an adequate supply of land for a lengthy rotation of at least ten years from planting to harvest.

Finally, there is a rather unusual demand for farmland from Europeans who are searching for an escape should armed conflict threaten their present lifestyles and homes. The relative isolation of the Maritimes, and the relative cheapness of land there, are important factors in this respect. In 1983, according to the Assessment Branch of the New Brunswick Department of Municipal Affairs, some 921 properties in Kent County, or about 4.1 per cent of the total, were owned by non-residents. This was the second-highest proportion in New Brunswick, exceeded only by 5.6 per cent of properties under non-resident ownership in Charlotte County (adjacent to the United States in the southwest of the province). Although no area figures are available, 46 of these properties were owned by Europeans, mostly from West Germany. Indeed, in the five counties of Eastern New Brunswick (Gloucester, Northumberland, Kent, Westmorland, and Albert), 181 properties are listed as owned by West Germans, who are second only to American ownership in New Brunswick (New Brunswick Department of Municipal Affairs, 1983).

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*For more information on the conflicts between farmers and other rural dwellers, refer to McRae, 1981; Mandale, 1980; New Brunswick, Province of, 1982; and Russwurm, 1974.

Whether the land will be available to accommodate all these demands remains to be seen. Only one respondent said his land would be sold when he died or otherwise left the holding; almost all respondents (24) said the land would stay in the family. The ingrained traditions of "one foot on the land" appear to be quite potent factors influencing rural change in Eastern New Brunswick, even though direct competition between different uses is not, on the whole, very intense except at a localized level.

Profitability of Agriculture

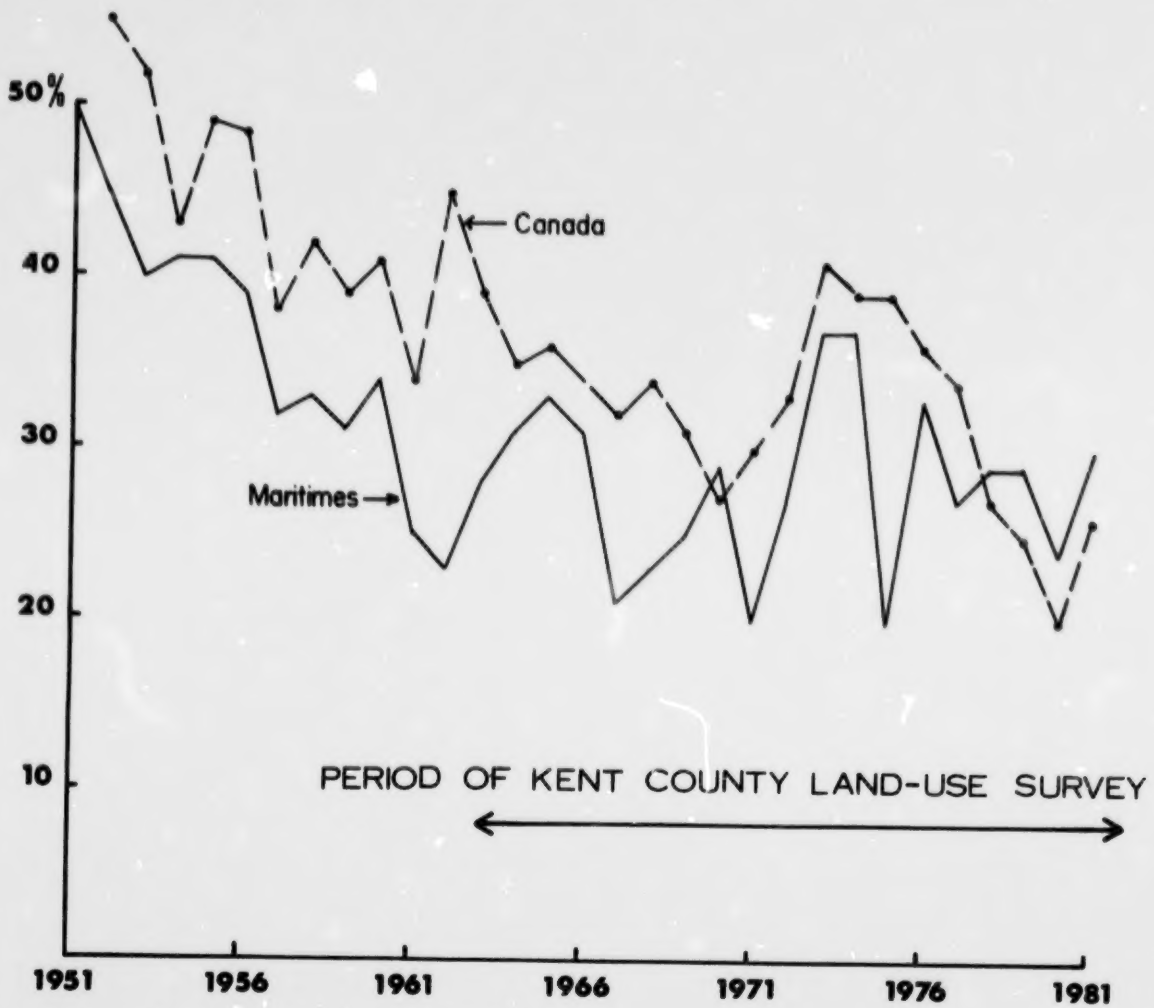
> "Agriculture (in Kent County) is primarily a means of subsistence and it ensures a place to live; to call it an economic activity is usually too generous." (Pêpin, 1968).

Over the Maritimes as a whole, the profitability of agricultural enterprises has been below that of Canada in almost every year since 1951 (Figure 4.1). Only in the late 1970s has there been evidence of a more sustained period profitability in excess of the Canadian average, as measured by net farm income as a proportion of gross farm income. There has, in fact, been an erratic decline in agricultural profitability at both national and regional levels since 1951. Net farm income in Canada as a whole stood at 60 per cent of gross farm income in 1951, but had declined to about a quarter by 1981. Corresponding figures for the Maritimes are 50 per cent and 30 per cent respectively. The wide fluctuations which characterize both curves in Figure 4.1 are caused by a continuation of widely varying prices for certain commodities (coupled to varying levels of production over time) and varying costs of production. The difference between costs and prices, particularly when the gap narrows markedly, remains a strong concern of Maritime farmers. Markets and low prices, high costs of production, high start-up costs, and general lack of profitability were the reasons most frequently cited by survey respondents as major problems in making a living from the land in Kent County (Table 4.3 A and B).

The curves representing profit margins in Figure 4.1 deserve a further comment. Higher profitability in the earlier years, particularly in the Maritimes, does not necessarily mean greater net cash income. Income-in-kind in 1951 accounted for more than a quarter of gross income in the Maritimes, double the national proportion (Table 4.4). A

FIGURE 4.1

NET FARM INCOME AS PROPORTION OF GROSS FARM INCOME
MARITIME PROVINCES AND CANADA, 1951-1981



Source: Statistics Canada, Various Dates

TABLE 4.3 A

RANGE OF PROBLEMS PERCEIVED BY A SELECTED SAMPLE OF RURAL LANDHOLDERS IN MAKING A LIVING FROM THE LAND IN KENT COUNTY

	Number of Responses (Maximum: 27)
Markets and low prices	14
High costs of production	8
High start-up costs	6
General lack of profitability	6
Lack of land	5
Inefficient land market	3
Climate	2

TABLE 4.3 B

MAIN PROBLEMS/CONSTRAINTS TO FARMING IN KENT COUNTY AS PERCEIVED BY A SELECTED SAMPLE OF RURAL LANDHOLDERS

	Number of Responses (Maximum: 27)
Low prices/high costs	10
Problems of machinery acquisition	6
Not enough land for expansion	3
Marketing Board/Quota problems	3

Source: Maritime Resource Management Service, Landholder Survey.

Note: Exact questions were:
Table 4.3A: What are the major problems associated with making a living from the land in this region? (Q32).
Table 4.3B: What are the main problems or constraints to the efficient operation of your land-using enterprise? (Q37).

TABLE 4.4

INCOME IN KIND AS PROPORTION OF GROSS FARM INCOME, MARITIME PROVINCES AND CANADA, SELECTED YEARS 1951-1981

	Maritime Provinces	Canada
	- per cent -	
1951	25.7	12.1
1956	24.2	12.7
1961	19.0	11.6
1966	13.1	9.5
1971	10.9	9.7
1976	6.8	9.0
1981	2.0 (a)	1.4 (a)

Source: Statistics Canada, 1982. Farm Net Income, Catalogue 21-202.

Note (a): Income-in-kind is the value of production actually consumed on the farm. The most important elements in 1981 (by declining order of rank) were meat, fruits and vegetables (including potatoes), forest products, dairy products, and poultry and eggs. As well, in years up to 1981, a significant element was house rent; this was excluded in 1981.

decline of this proportion over the years indicates the increasingly commercial nature of agriculture, and also reflects the demise of many smaller, non-commercial operations in the Maritimes.

In addition, wide swings in income from year to year can be closely correlated to the success of potato and apple crops in all three provinces. For example, quite spectacular years in the early and middle 1970s came on the heels of very good prices for both commodities. Again, although apple prices in 1980 were average, potato prices reached their highest levels ever, and as the crop moved to market in early 1981, farm cash receipts for potatoes in New Brunswick and Prince Edward Island were high enough to maintain a level of profitability in the Maritimes higher than the national average.

This relatively successful performance by Maritime farmers since about 1976 cannot mask the vulnerability of the region's agriculture to wide swings in prices for a limited number of specialized crops, particularly with the rapidly increasing input costs which characterized the late 1970s. Between 1976 and 1981, total farm operating expenses rose by 81 per cent with particularly big increases in debt charges, total machinery expenses (including energy costs), and feed prices (Table 4.5). These increases, although generally lower than at the national level, have exceeded both the rate of increase in general inflation (as measured by the Consumer Price Index), and the rate of increase of total farm cash receipts over the same period.

The sharp fluctuations in farm prices and profitability in the face of rapidly rising farm input costs has fostered an air of uncertainty among farmers in the Maritimes. This level of uncertainty is heightened in Eastern New Brunswick where high-value crop production and agricultural profitability are below levels for the Maritimes and, as a result, provide little surplus in a good year to carry farmers over subsequent lean years.

The lack of farm profitability and air of uncertainty has had consequences for the land resource. Farmers have been unwilling or unable to enlarge their operation or to make long-term investments necessary to improve their land base in the face of unpredictable swings in prices from year to year, and recently, high interest rates. This has been aggravated by the unwillingness of landholders who do not farm to sell their land to commercial operations, as discussed in the previous section. The stage is set, therefore, for the abandonment of agricultural land, or its conversion to other uses.

Survival in agriculture in Eastern New Brunswick, as elsewhere, has meant adapting to changing economic circumstances caused by fluctuating prices, increased input costs and lower per unit profits. One, or usually, a combination of several strategies have been pursued, including farm enlargement (already discussed), intensification of land use and specialization of production through changes in the crop/activity mix. All of these strategies have involved increased capitalization.

There is evidence both from the census and the land-use survey that the past few years have seen intensification of agriculture in Kent County (Table 3.7). Within the area of land

TABLE 4.5

RATES OF CHANGE OF SELECTED FARM OPERATING EXPENSES, TOTAL FARM CASH RECEIPTS AND THE CONSUMER PRICE INDEX, MARITIME PROVINCES (1) AND CANADA (2) 1976-1981

	Per Cent Increase in Costs, 1976-1981		Individual Costs as Proportion of Total Operating Expenses			
			1976		1981	
	(1)	(2)	(1)	(2)	(1)	(2)
Wages to Farm Labour	+46.3	+59.4	17.2	10.2	14.3	7.9
Interest on Indebtedness	+207.4	+223.9	6.2	11.3	10.8	17.6
Total Machinery Expenses	+93.6	+95.1	12.9	17.4	14.1	16.5
Fertilizer and Lime	+42.5	+126.7	11.0	8.1	8.9	8.9
Feed Expenses	+87.9	+82.0	28.3	19.0	30.2	16.8
Other	+57.2	+95.7	25.4	34.0	21.7	32.3
Total Operating Expenses	+76.4	+106.0	100.0	100.0	100.0	100.0
Total Farm Cash Receipts	+78.4	+84.0	-	-	-	-
Consumer Price Index	N/A	+59.1	-	-	-	-

Source: Agriculture Canada, 1982b, 49.

Note: Other farm operating expenses include taxes, gross farm rent, other crop expenses, pesticides, other livestock expenses, repairs to buildings, electricity and telephone, and miscellaneous.

which remained in agricultural use between 1963 and 1982, 1424 hectares shifted from extensive to intensive agriculture use. A further 298 hectares of land formerly in agriculture or other uses also became intensively farmed*. In addition, the proportion of land on the average farm which was improved increased between 1961 and 1981 as did the proportion of improved land which was cropped (Table 3.4).

Specialization has characterized both new crop farms and the more traditional livestock enterprises in Eastern New Brunswick (Table 4.6). Emphasis on dairy and livestock enterprises has continued, accounting for 62.3 per cent of all commercial operations in the region by 1981. Gone, however, are the traditional mixed livestock farms which decreased from 24.0 per cent of commercial farms in 1961 to only 3.7 per cent by 1981. Surviving farm operations in Eastern New Brunswick have tended to specialize in beef, hogs, or sheep (up to 30.3 per cent of commercial operators in 1981 from 16.9 per cent in 1961) or in specialized crop farms, particularly fruit and vegetables, which increased proportionately from 3.5 per cent of all farm operators in 1961 to fully 25.5 per cent by 1981.

Most of the new and relatively successful types of fruit and vegetable enterprises in Eastern New Brunswick are land-intensive, and this to a degree explains the growth in the area of intensively farmed land. Specialist crops such as Brussels sprouts also have quite long rotations (at least four years) so a single year's crop needs a land base of a least the number of years in the rotation multiplied by that single year's area. Yet, the substantial proportional rise in speciality horticultural and crop farms translated into a net increase of less than 1,000 hectares (1,019 to 1,985 ha) of intensively farmed land in Kent County over the 1963 to 1982 period (Table 3.9).

Other possible areas of farm specialization in Eastern New Brunswick such as livestock and small grains have been limited in expansion by external competition. Livestock farmers in the region generally do their marketing through local wholesalers or processing plants, and are therefore in direct competition with farmers over a much wider area of North America. As some types of enterprise, such as beef production, have become highly specialized in other parts of Canada and the United States, and given the generally small size of local herds as indicated in the landholder survey, livestock farming in Eastern New Brunswick has become marginal at best.

Although yields of feed grains are much higher in the Maritimes than in Western Canada, this competitive advantage is substantially nullified by the subsidy on transporting western grain. The proportion of small grain farms in Eastern New Brunswick was still very small (1.7 per cent) in 1981 (Table 4.6). Feed grains from provinces to the west enter the Atlantic region at subsidized freight

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*A much smaller area, 756 hectares, was lost to intensive agriculture over the twenty-year period (Table 3.9).

TABLE 4.6

COMMERCIAL FARMS (1) CLASSIFIED BY PRODUCT TYPE, EASTERN NEW BRUNSWICK (2) 1961, 1971, 1981

Type of Farm	1961	1971	1981
		- per cent -	
Dairy	37.6	44.4	26.9
Cattle, hogs, sheep	16.9	23.7	30.3
Poultry	8.6	7.1	5.1
Dairy and Livestock	63.1	75.2	62.3
Small grains	0.1	0.3	1.7
Field crops, other than small grains	3.1	8.1	7.9
Fruits and vegetables	0.3	4.4	15.9
Specialized Crops	3.5	12.8	25.5
Miscellaneous specialty	1.0	0.7	8.8
Mixed	24.0	6.1	3.7
Forestry	8.3	5.1	N/A
Total Commercial Farms			
per cent	100.0	100.0	100.0
number	699	295	353

Source: Census of Agriculture.

Notes (1): A commercial farm in 1961 was defined by the census as having sales of $1,200 or more, and for 1971 and 1981 as having sales of $2,500 or more.

(2): Eastern New Brunswick includes Kent, Gloucester and Northumberland counties.

rates under the Feed Freight Assistance Act of 1941*. Local demand for land to produce grain is reduced accordingly.

Specialization and intensification have typified the pockets of agricultural prosperity which have survived in Kent County. The other side of this same coin infers that lack of ability or willingness of farmers to change the crop/activity mix, specialize and intensify to maintain agricultural productivity and profitability has resulted in an overall net loss of land from farming greatly exceeding the net gain to intensive agriculture.

Strategies of farm enlargement, increased specialization of production and intensification of land use require significant capital investment. Such investment has increased on surviving Kent County farms, but still lags behind Atlantic Canada. The total capital value per farm in Kent County has increased quite substantially since 1951, from under $5,000 to over $25,000, as has the value of land and buildings per improved hectare. As well, the proportion of total capital values accounted for by land and buildings has increased, but only slightly. It was about 59 per cent in 1951 ($2,741 of a total of $4,643) and had increased to almost 65 per cent in 1981 ($17,404 of $26,854). As with many other indicators, however, capital values per farm in Kent County in 1981 remain at levels significantly below the Atlantic average, and there have been few, if any, advances in reducing this disparity. Furthermore, most advances in this respect have occurred since 1971, and this supports earlier evidence that much of the land lost to agriculture between 1963 and 1982 was lost during the 1960s, with a minor reversal of this trend during the 1970s.

The workings of the credit market in Eastern New Brunswick have also tended to contribute to low levels of farm investment and operating capital, therefore reducing the potential for farm enlargement, intensification and specialization, and as a consequence, leading to declines in farm profitability. Capital and associated credit management advice has been less available to agriculture in an area where the sector's perceived profitability is marginal. Reinforcing this has been the tendency in Eastern New Brunswick to adhere quite strongly to a wider Maritime trait of aversion to debt. This attitude is changing, but remnants still linger. Several respondents in the landholder survey remarked that they had never sought financing, mainly because of varying degrees of mistrust or dislike of debt. There are still difficulties, as well, in obtaining short-term operating capital, although it appears that long-term investment or expansion capital is more generally available, usually by means of a variety of federal or provincial assistance programs (e.g., Farm Credit Corporation). The record of these public lending programs has been reasonably satisfactory in the Maritimes. (See Atlantic Development Board, 1969, 119-120). About 50 per cent of agricultural debt, mostly long-term, is owed to federal and provincial agencies, while 30 per cent, most short-term, is owed to the bank, and 20 per cent, also short-term, is held by credit unions, insurance, trust and loan companies, and individuals (Statistics Canada, Farm Net Income).

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*For a discussion of the implications of this Act, refer to A. Sorflaten, 1977.

Most operating capital available to farmers in New Brunswick, as elsewhere in the Maritimes, comes from private institutions. These include the major chartered banks, trust and loan companies, and a variety of credit unions. The caisses populaires are the most widespread example of the latter in Eastern New Brunswick, a cooperative endeavour with small branches throughout the region. Traditionally, the caisses have not been very active in agricultural lending; outstanding agricultural debt owed to credit unions in New Brunswick reached a peak over the past decade or so in 1974. That particular year represented a period of unusually high net incomes (Figure 4.1) for all Canadian farmers. Farmers in New Brunswick at that time owed 5.3 per cent of all their debt to credit unions. Since then, this proportion has declined to less than one per cent.

During the same period, agricultural debt owed to chartered banks in New Brunswick maintained a proportion of about 30 per cent. The chartered banks as sources of agricultural capital throughout the Maritimes, however, concentrate their efforts on larger areas of specialization, where farming has been demonstrated as a profitable enterprise. One difficulty in this respect is that even the considerable resources of the chartered banks cannot justify more than one or two specialized personnel to advise on agricultural matters for the entire Atlantic region, and services such as these virtually do not exist at the caisses populaires. Only in the occasional instance, when a local farmer belongs to the Board of Directors of a caisse populaire, can any specialized experience enter a decision on whether or not to grant credit to a farm enterprise.

More serious, however, is the underlying nature of farming. As one report put it:

> "The banks tend to avoid such lending (for operating expenses) unless the farmer has an established record of adequate income and prompt repayment." (Atlantic Development Board 1969, 120).

And another:

> "Agricultural borrowers are at a disadvantage vis-à-vis borrowers in other sectors because risks are thought to be higher. Producers are exposed to wide seasonal, year-to-year and cyclical fluctuations in the prices of their commodities. Accordingly, lenders tend to direct capital from agriculture to other sectors where risks are believed to be lower, or at least more predictable." (New Brunswick, Province of, 1977, 75).

Both these reports referred to agriculture at a regional or provincial level. If capital is so difficult to attract at these two levels, then much of Kent County agriculture up to the mid- or late-1970s must qualify as being at a particular disadvantage because of demonstrated lack of profitability.

One variation on farm enlargement in Eastern New Brunswick that, in part, helps to overcome shortages of capital and facilitates specialization is cooperatives, which are characteristic of many Acadian endeavours. Cooperatives enable a group of landholders to pool available resources to reach more efficient levels of production. Usually, this has involved group acquisition of machinery and equipment, and centralized storage, preparation and packing facilities. There are also advantages in terms of bulk purchases of inputs, and in bargaining with major buyers over prices for output. Whereas each of the members of the group as individuals could not aspire to more efficient levels of operation as easily, cooperation is one way to facilitate this process.

About half of all co-ops in New Brunswick agriculture are in the predominantly Acadian counties of Gloucester and Kent, and in many cases have assured the survival of pockets of agriculture which may otherwise have disappeared (New Brunswick Department of Agriculture and Rural Development, 1977). Only five respondents to the landholder survey said they did not belong to a co-op, and many belonged to several.

Technology and Mechanization

Use of the latest machinery and the most up-to-date crop varieties, fertilizer, pesticides and farm management techniques has become the hallmark of modern farming, and in many ways, a necessity for survival in agriculture. Adoption of new farming techniques and use of new technology in the field as well as for storage and bulk handling has facilitated the enlargement of farms, the clearance of fields, the intensification of land use, the specialization of production, and generally, the improved economic position of remaining farms. In terms of machinery acquisition, adoption of widely accepted farming practices (e.g., drainage) and changes to the farm holding, Kent County appears to have lagged behind. Responses to the landholder survey help to indicate that in Kent County improvements on farms have largely been a phenomenon of the 1970s rather than earlier (Table 4.7). Even where this process had begun in the 1960s, there was usually an acceleration of activity in the 1970s, particularly for erecting new farm buildings, clearing woodlots, draining land, and acquiring specialized machinery.

Intensification of farmland use usually involves some degree of technological advance or adoption of available technology, but in this respect there has been little innovation geared specifically to Maritime farming (with the notable exception of potato harvesters). Only two survey respondents in Kent County said that innovations or new practices had caused land-use change on their holdings over the past five years (since about 1976), and these involved adoption of "advances" such as the addition of silos or drain tiles.

The relatively slow rates of adoption of new farm machinery and equipment are also revealed by census data (Table 4.8). Kent County lagged behing the Atlantic average in terms of the proportion of farms with certain widely accepted pieces of machinery in the 1950s and most of the 1960s. This was particularly so for such basics as tractors, motor trucks, and milking machines. Only as the 1970s progressed did Kent County begin to catch up and achieve the regional average to the stage that in 1981, the county's few remaining farms were, for the most part, relatively more mechanized than farms in general throughout the region.

The pattern of Kent County lagging behind the regional average in technology adoption is especially evident in terms of the average number of machines per farm (Table 4.9). In 1951 and 1961, the average number of machines per farm were, in almost all cases, lower in Kent County than Atlantic Canada as a whole. Although Table 4.8 reveals that the proportion of farms with various machines in Kent County

TABLE 4.7

RANGE OF COMPLETED AND PROPOSED CHANGES TO FARMS, RURAL LANDHOLDER SURVEY, KENT COUNTY

	1961-1971	1971-1982	1982-1987
Splitting of land	2	7	4
New farm buildings	6	15	3
Fencing of unfenced areas	12	9	9
Fence removal	6	6	6
Woodlot clearance	2	12	6
Drainage	3	13	14
Field abandonment	2	5	1
Gravel extraction	3	2	-
Bulk-handling acquisition	1	7	1
Major machinery acquisition	11	18	8

Source: Maritime Resource Management Service, Landholder Survey.

Note: Respondents also mentioned other modifications affecting their land or farms, including severing a house site, building a new residence, planting a woodlot, constructing a farm pond, consolidating land, and acquiring land.

TABLE 4.8

MECHANIZATION TRENDS ON FARMS IN KENT COUNTY AND ATLANTIC CANADA, 1951-1981

	1951	1961	1971	1981
	- per cent of all farms reporting -			
Tractors:				
Kent	13.1	46.1	74.6	88.1
Atlantic Canada	29.4	55.3	77.2	85.0
Motor Trucks:				
Kent	10.7	26.3	41.4	63.9
Atlantic Canada	18.7	39.0	55.8	68.7
Grain Combines:				
Kent	(a)	2.7	11.5	17.1
Atlantic Canada	0.4	4.7	13.9	16.6
Pick-up Balers:				
Kent	(c)	7.0	42.1	50.8
Atlantic Canada	(c)	12.1	39.1	51.8
Forage Harvesters:				
Kent	(c)	1.8	3.5	8.7
Atlantic Canada	(c)	1.1	3.6	8.9
Swathers:				
Kent	(c)	(c)	3.7	18.3
Atlantic Canada	(c)	(c)	1.8	7.1
Milking Machines:				
Kent	1.2	12.0	26.4	(c)
Atlantic Canada	6.6	19.6	25.4	(c)
Electric Power (b):				
Kent	53.3	95.6	(c)	(c)
Atlantic Canada	56.9	90.4	(c)	(c)
Total Number of Farms:				
Kent	2,328	1,103	401	252
Atlantic Canada	63,709	33,409	17,078	12,941

Source: Census of Agriculture

Notes:
a) less than 0.05 per cent
b) from one or more sources of power
c) data not reported or available for these censuses

TABLE 4.9

NUMBERS OF MACHINES ON FARMS, KENT COUNTY, 1951-1981[a]

	1951	1961	1971	1981	Per Cent Change 1951-1981
Tractors	307	527	377	371	+20.8
Average/Farm: Kent	0.13	0.48	0.94	1.47	
Average/Farm: Atlantic	0.15	0.64	1.15	1.63	
Motor Trucks	266	315	188	198	-25.6
Average/Farm: Kent	0.11	0.29	0.47	0.79	
Average/Farm: Atlantic	0.20	0.44	0.71	1.06	
Grain Combines	1	30	46	45	+4500
Average/Farm: Kent	(b)	0.03	0.11	0.18	
Average/Farm: Atlantic	(b)	0.05	0.14	0.17	
Pick-up Balers	(c)	77	169	132	+71.4
Average/Farm: Kent	(c)	0.07	0.42	0.52	
Average/Farm: Atlantic	(c)	0.12	0.39	0.54	
Forage Harvesters	(c)	21	15	24	+14.3
Average/Farm: Kent	(c)	0.02	0.04	0.09	
Average/Farm: Atlantic	(c)	0.01	0.04	0.10	
Swathers	(c)	(c)	16	48	+300.0
Average/Farm: Kent	(c)	(c)	0.04	0.19	
Average/Farm: Atlantic	(c)	(c)	0.02	0.08	

Source: Census of Agriculture

Notes: (a) Average number of pieces of equipment per farm derived using all farms.
(b) Too few machines to permit calculation.
(c) Data were not collected for these machines.

was beginning to approach, and in some cases exceed, the regional average, Table 4.9 indicates that the average number of machines per farm in 1971 still remained below regional averages, in some cases substantially below, and this pattern was repeated in 1981 for all indicated pieces of machinery except grain combines and swathers.

If the analysis is pursued further, however, Kent County farms are also shown to be lagging behind, even in terms of grain combines and swathers. Firstly, with respect to grain combines, Kent County is relatively well-endowed for growing grain, from the stand-point of climate, topography, and soils. The most important grain-growing area in the region, Prince Edward Island, is similarly well endowed for grain, and indeed, the average number of grain combines per farm on the Island in 1981 (0.37) was substantially higher than in Kent County (0.18). This indicates that Kent County is still relatively disadvantaged in numbers of grain combines. Secondly, swathers are particularly used to row hay which is not to be used for silage, with the latter usually being made using forage harvesters. Once again, Kent County is revealed to be lagging behind the regional average with its relatively large numbers of less sophisticated machines, such as swathers, than in the region as a whole.

Most intensification of agriculture in Atlantic Canada has involved adoption of developments from other parts of Canada, and although mechanization in general has increased in the region's agriculture, lack of research into technologies and agrology specific to the soils, climate and crops of the Atlantic region has probably assisted the decline of agriculture away from areas of specialized production. As the Atlantic Development Board noted:

> "The post-war impact of the new technological environment in Canadian agriculture was greatest in the regions having large areas of fertile land suitable for large scale mechanized operations. In regions like the Maritime Provinces, the impact (of new technology) was held back by the physical, economic and institutional conditions that prevailed". (Atlantic Development Board 1969, 95).

There are three broad features which have hindered adjustment to new technology in the Maritimes: land, climate, and location. Physically, the land is frequently unsuitable because of rough topography, stones, poor drainage, and so on. Moreover, it is frequently split up into fragmented units that are too small and scattered for effective mechanized operation. Climate does not generally favour profitable farming because of short, cool growing seasons. The location of farming areas is generally remote from major markets which significantly add to transportation costs. And the bottom line, the lack of profitability in farming, reduces the financial capability to purchase new machinery and adopt new technology and methods.

Agricultural research within the Atlantic region has traditionally been aimed at larger-scale specialized production of traditional farm produce, such as potatoes or livestock nutrition. The adoption of new crops to the region has largely been excluded from the research agenda to the detriment of potential new enterprises. In the case of Kent County, this meant, for example, that initial attempts to grow Brussels sprouts in the Rogersville area had to take their lead in growing methods and techniques from European experience. Tobacco farmers observed methods of production developed in Ontario and Quebec, rather than those developed locally and adapted to more specific local conditions.

A further pattern in this respect falls within the framework of technology transfer; this will receive more attention in a subsequent section on skills and management.

Markets*

As net income accruing to farmers has fluctuated widely since 1951, and has generally been reduced, consideration of markets and their influence on land-use change is quite important. Unlike many other industries, the farmer is generally limited in his ability to pass on increased costs of production to consumers. In addition, increasing specialization over the years, made necessary to improve efficiency and productivity, has had the effect of making producers more vulnerable to wide year-to-year swings in prices (Figure 4.1). Greatly increased regulation and grading standards impose further costs on farmers and further reduce income. Increased standardization and efficiency has usually meant larger processing and packaging facilities.

The overvall effect of trends such as these has been to reduce the share of the food dollar which reaches the farmer and generally to increase the share going to processors, packers, wholesalers, and retailers. In areas of lower agricultural profitability such as Eastern New Brunswick, this is yet another influence to encourage the loss of land to agriculture. Those surveyed in Kent County mostly sold to the traditional outlets such as local wholesalers, processors, packers, or through a marketing agency for certain commodities such as milk, cream, and tobacco. The wholesalers and processors are mostly based in Moncton with other centres of distribution in Sackville and Saint John. An important agency, the Milk Marketing Board, is run from Sussex, New Brunswick.

It is quite striking in Kent County and neighbouring areas that only where new markets for produce have been identified and pursued has agriculture as a land use remained competitive. Thus, a group of vegetable growers around Rogersville in Northumberland County began growing Brussels sprouts for sale to a new freezing plant in the Saint John River Valley in the late 1950s. Through carefully pacing expansion of the area under cultivation in line with demands from the plant, and cooperatively undertaking bargaining on the price of each year's crop, the farmers have expanded the area grown to 250-300 hectares per year in a seven-year rotation (which, of course, necessitates maintenance of land-base of 1,750-2,100 hectares).

Another small group of successful farmers in the County have expanded tobacco production in a fairly concentrated area around Buctouche, largely within the past 20 years. Only one Kent County farm reported tobacco in 1961, as opposed to five in 1981 with a further two in Westmorland County immediately to the south. Maritime tobacco has gained wide acceptance in available markets in North America and Europe because of its high quality compared to major Canadian producing areas in Ontario and Quebec. Marketing is tightly controlled with poundage quotas for each season (and therefore area to be planted) agreed on before planting occurs.

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*The introductory remarks in this section are based on Chapter 12 of the New Brunswick Agriculture Resource Study (New Brunswick, Province of, 1977).

Markets are not getting easier to find, and a variety of ploys are being tried to sell produce. Ten of the 22 commercial farmers surveyed remarked that they had changed marketing strategies substantially since the early 1970s. Some livestock farmers have changed from selling to a meat-packing plant in Moncton to selling to local butchers; others have gone in the other direction. For some specialist crop producers there has been adoption of U-Pick practices, or renting stalls in Farmers' Markets.

As with many other influences contributing to land-use change, the innovative farmers have ensured that a part of the original cleared land has stayed in agricultural use. Failure to identify and cultivate commercial markets over much of the three decades since 1951 has contributed, however, to a sizeable net loss of land to agriculture.

Skills and Management

An important part of the post-war productivity revolution in Canadian agriculture has involved a great deal of scientific research into crops, animal husbandry, and application of new technology to the farm. The advances achieved in agricultural laboratories and experimental stations have provided the tools for farmers to become extremely efficient, but individual use of these tools has also required a learning process on the part of the farmers themselves. This "technology transfer" process, whereby farmer skills are enhanced and improved, is a vital part of overall farm viability. It has been accomplished usually by one of two means. Firstly, there have been formal courses of education, ranging from short courses to courses of four years or longer, which can lead to advanced, specialized training. Secondly, there have been extension services, whereby specialist agricultural representatives have demonstrated new techniques of production to individual farmers as part of their year-to-year operations.

Agricultural training has been available to some extent. To illustrate, twelve of the 22 commercial farmers interviewed in Kent County said that they had undertaken some formal agricultural training. Seven of these had done at least part of the agricultural course at College St-Joseph in nearby Memramcook (largely discontinued in the 1950s), while one or two others had ventured to one of Quebec's agricultural institutes. Most of these were still farming in 1982.

Kent and Gloucester counties for long held the unenviable reputation of the lowest levels of high-school education in all of Canada. A variety of factors contributed to this unfortunate state of affairs, including large families and a very low tax base in the two counties. The former of these gave a strong incentive for children to become self-sufficient at an early age, if not actually to contribute to the household income. The latter situation has improved greatly since 1967 (when New Brunswick implemented its Equal Opportunity Program which provided a lot more money from the provincial treasury for most rural municipal services), and with the establishment of l'Université de Moncton and other French-language educational institutions.

This progress has, by and large, by-passed agriculture. A two-year agricultural course at Memramcook was substantially discontinued in the early 1950s, although some remnants of courses survived until the early 1970s by which time l'Université de Moncton had displaced or absorbed College St-Joseph as the premier French-language higher education facility in New Brunswick. The only alternative agricultural courses in French were in Quebec, and were often directed at a different type of husbandry. English-language instruction was, and still is, available at the Nova Scotia Agricultural College, and in other parts of Canada.

Agricultural extension services available to farmers in Kent County are, in the early 1980s, more easily accessible than at any time before. This ease of access was not always a characteristic, however, particularly to French-speaking farmers. Most such services were devised and administered by the Province, and have been important parts of provincial agricultural development strategies since the early 1950s. Predominantly English-speaking agricultural representatives and technicians during the earlier years had effectively meant that such programs were less available to French farmers in Northern and Eastern New Brunswick.

As noted by the New Brunswick Agricultural Resources Study in 1977:

> "Northern New Brunswick (the predominantly French-speaking areas) has perennially been isolated from the normal flow of the Province's agricultural life.... Agricultural research in New Brunswick has been conducted almost exclusively at the Fredericton Research Station and, as such, is largely applicable only to southern areas of the Province. Coupled with this inapplicability of research, information about new technologies is available to French producers only in English". (New Brunswick, Province of, 1977, 71).

It is an established fact that there has been a great receptiveness to new ideas amongst French-speaking farmers. The original settlers on the marshes around the Bay of Fundy were French, and these settlers devised and built intricate schemes of dykes and tidal dams to protect marshland from salt-water and thus make it suitable for cultivation. The "agronome", or French extension agent, has been traditionally accorded a respect equal to that extended to the priest and schoolteacher. Displacement or replacement of an agronome with an English-speaking agricultural representative appears to have severely inhibited French farmers from seeking technical and scientific assistance for many years. It thus contributed to the overall decline in agriculture and the rural economy in Eastern New Brunswick.

The overall picture of access to extension services has improved considerably in recent years. Extension services in the early 1980s are more available and are tailored to local requirements. An important step was taken with establishment of a federal experimental farm near Buctouche in 1979. Research at this experimental station is particularly concerned with vegetables, fruits, and a variety of cereal and forage crop trials oriented towards physical conditions in Eastern New Brunswick (Agriculture Canada, 1982a, 1982c). As with many other factors outlined in this chapter, however, this initiative came after substantial rural decline and agricultural land abandonment in the region.

Other, more subtle processes have also affected the dissemination of farming skills and techniques, as well as changes in community attitudes. Decline in rural economic activities in Kent County has been quite substantial, and farms which have survived tend to occur in scattered pockets or clusters, or are simply isolated. Exchange of information between farmers is thus quite severely deterred as the neighbouring farms may be located at some distance. This has inhibited dissemination of information and may have had a strong influence on agricultural decline. Erosion of such a network of exchange has been particularly poignant in an area with a strong sense of community. It also extends to schools, where farmers' children are much less likely to rub shoulders with other farmers' children.

Farm Labour

Across Canada, agricultural employment has progressively accounted for a smaller and smaller proportion of total employment over the past decades. In 1961, for example, agriculture accounted for a little over 11 per cent of all employment, but by 1981 this had declined to 4.4 per cent (Agriculture Canada, 1980, 1982b). The reasons given for this are usually couched in terms of low wages, hard work, and long hours on farms compared to alternative urban employment. Skilled labour requirements over the same period have, however, increased as agriculture enterprises have become more and more technically sophisticated.

Demand for labour from Kent County farmers has increased on a per farm basis since 1951. About 16 per cent of all census farms in 1951 reported paying wages for farm labour compared to almost 42 per cent in 1981, although the actual number of farms reporting wages paid to labour in this latter year was much smaller than in 1951 because of the precipitous decrease in farms.

Agriculture in Kent County has been characterized earlier in this report as only semi-commercial for at least the first 15 or 20 years after 1945, and this is also borne out by census farm labour data. Some 88 per cent of the total number of weeks labour reported by Kent County farmers in 1961 went unpaid, presumably carried out by family members. Most labour on Kent County farms also tends to be seasonal in nature; in 1981, for example, 4,282 of 5,694 weeks of paid labour reported to the census were for seasonal work.

Family labour still plays an important part in Kent County. Data from the landholder survey indicate that 14 of the 22 commercial farmers surveyed had relatives working for them in 1982, with eight working for pay, and six for no pay. Sixteen respondents also said they had other workers hired, of which only one worked full-time. The remainder took casual or seasonal workers as the need arose, mostly at hay time, seed time, harvest time, or when fencing was to be done.

Although Eastern New Brunswick has traditionally been an area of high unemployment, paradoxically there are indications that Kent County farmers in the 1960s and 1970s have had difficulty in finding adequate labour, a particularly important factor in survival if capital was not available to buy machinery that could substitute for this labour. The New Brunswick Agriculture Resources Study reported that a survey of farmers in Ste-Marie parish, southern Kent County, revealed that almost half (47.6 per cent) of the farmers had difficulty finding labour (New Brunswick, Province of, 1977). The reasons most frequently cited for this difficulty were low wages (usually below the provincial minimum wage), long hours, and lack of personnel management skills on the part of the farmers, which contributed to high turnover of labour. In addition, New Brunswick shares with most other parts of Canada, extensive exemption for farm labour from provincial labour legislation. This means, for example, that agricultural employers are not bound by the Minimum Wage Act, the Minimum Employments Standards Act, nor the Vacations Pay Act.

It appears, therefore, that as the principal source of labour available to farmers has changed during the past three decades (from primarily family members to hired help) the labour supply has generally been inadequate to meet demand from Kent County farmers. Lack of adequate farm labour may have adversely affected those farmers struggling to establish and nurture a commercial operation, and in this respect, played a role in speeding the abandonment of farmland in Kent County.

Infrastructure

A rural economy requires an intricate support structure in terms both of economic pursuits and the community. The extent to which decline in this structure causes land-use change, or vice-versa is circular and cumulative. Once farming in an area drops below a certain "critical mass", infrastructure disappears (Beattie, Bond and Manning, 1981). This causes more farmland to be abandoned, and thus the process accelerates. The loss in agricultural services will also cause an associated loss of traditional and usually respected rural values.

Landholders' opinions on changes in the more important agricultural and community services in Kent County since the early 1970s was quite varied (Table 4.10). In general, access to private sector, farm-oriented business services, such as local processors or farm suppliers, was regarded as worse than before. In contrast, access to publicly provided services, such as farm extension advice or training programs, was usually regarded as at least the same as before, and often better.

There are qualifications to these patterns. Firstly, not all people need the same range of services; a tobacco grower, for example, is unlikely to require the services of a veterinarian very often. Secondly, many agricultural services have concentrated in larger centres such as Moncton or Newcastle (on the Miramichi) and farmers must now travel

TABLE 4.10

CHANGES IN ACCESS TO FACILITIES AND SERVICES AS PERCEIVED BY RURAL LANDHOLDERS SINCE 1972

	No Services	Worse than Before	Same as Before	Better than Before
Transport	-	6	10	7
Local processors	5	13	3	1
Farm suppliers	1	15	9	1
Veterinary services	5	7	8	3
Machine dealers/repair	1	13	9	1
Hardware/fencing	1	11	12	-
Credit services/advice	1	6	9	8
Farm extension/advice	1	2	13	9
Training programs	2	-	9	13
Community services	-	-	14	5
Retail stores	-	-	18	9

Source: Maritime Resource Management Service, Landholder Survey.

greater distances to avail themselves of these services. In addition, there was apparently never any great development of establishments depending exclusively on farmers for business, unless there were potential markets in other sectors such as forestry and fishing.

Lengthy efforts on the part of both federal and provincial governments have been devoted to avoiding complete agricultural collapse in Kent County, and to bring public programs towards a standard which obtains elsewhere in the province. Access to these kinds of programs and advice has generally improved in recent years, but this has come too late to avoid substantial abandonment of farmland.

Alternative Economic Opportunities

Often, the farm income and standard of living has not been able to compete with other economic opportunities, particularly in urban areas. Rural depopulation characterized the Maritime Provinces for much of the 1950s and 1960s. The net flow of people to towns and cities, both locally and at greater distances, has only been reduced to some extent in recent years by a movement back to rural residences by people seeking to combine an urban wage packet with the pleasures of living outside towns. Although the population of Kent County, in particular, has been increasing only slowly since 1881, much of this growth has been because of a high rate of natural growth which counter-balanced waves of emigration, mostly involving young people seeking work elsewhere. One researcher has calculated the extent of emigration from Kent County from 1921 to 1956 (Raiche, 1962). Total population increased by 3,756 from 23,916 in 1921 to 27,492 in 1956. By contrast, the estimated natural increase over the same period was 18,161. If the actual increase (3,756) is substracted from the natural increase, net emigration is estimated at 14,585 over the 35 year period. As the population of Kent County went down quite substantially until 1971, (when it was 24,901) it is evident that the late 1950s and 1960s saw emigration keep up its established pace.

Most of the people who left the County, (and the same pattern is evident in many parts of the Maritimes) were looking for work. (Refer to exhibit "Kent County in the mid-1960s; Life and Poverty".) They faced an uncertain future in their own home area, as land-based opportunities declined. The simultaneous increase of industrial development in nearby towns, and in Quebec, Ontario, and New England, offered an attractive alternative to a life of hard work for uncertain returns on the land. In any case, the land could less and less support the needs of everybody in an area of large families and increasing aspirations. Urban wages were higher, more reliable, involved regular hours, and offered scope to pursue greater leisure. (For a fictionalized version of the first main exodus of rural French Canadians to American factories during and after the First World War, see Ringuet (1940), especially Part 4, "Winter".)

Alternative economic opportunities in Eastern New Brunswick have traditionally been resource-based, including the fishery, forestry, and mining. A more diversified industrial base developed in nearby cities such as Moncton or Saint John, which acted as initial points of destination for rural

KENT COUNTY IN THE MID-1960s: LIFE AND POVERTY

A visual geographical approach to the County of Kent does not belie its reputation as a poor county according to Canadian social standards, with low incomes, economic dependence and the lack of amenities. What we have here is a continuum extending from modest means to poverty, both in areas bordering the coastline and in those near the marshy plain and the wastelands of the interior.

Along the coastline the lobster fishermen are fairly well off, but the workers employed in the processing of fish have low incomes (70 cents an hour for women and 80 cents an hour for men)... Women make up most of the labour force, and it is often a matter of earning an income supplementary to that of the husband. It should be noted that both incomes are generally necessary in order to balance the family budget.

Lobster, the basis of the fishing industry, is not inexhaustible; the season is short (two months) and buyers quickly buy up the catch... Apart from lobster, catches consist of types of fish of low commercial value. Techniques are geared for small-scale fishing, and are traditional and typical of a large part of the Atlantic coast.

Agriculture is integrated into a subsistence economy which is no longer capable of functioning, since the means of production now have to be bought and family manpower is vanishing through emigration. When the farm is not solely a place of residence, "a bit of everything" is produced, and this naturally does not lead to any great inroads into the urban market of Moncton, and hardly any at all into that of Newcastle-Chatham...

The forest is gaining ground and a good many farms are deserted... There is no general shift, however, from agriculture to lumbering.

The County of Kent is to be classed as a depressed area on the socio-economic level. A high point was reached during the second half of the nineteenth century with the lumber trade and shipbuilding, but since then the county has been on the down grade. It happened slowly at first, until the thirties, then ruthlessly after the 1939-1945 War, at which time rural communities were fragmented.

The County of Kent still lives in the nineteenth century. The drying up of immigration after 1850, the disappearance of ocean traffic, accelerated urbanization (elsehere) and its accompanying industry, are basic factors which had lead to the present situation.

The world of industry and of the machine has bypassed the County of Kent. The consumer market is insignificant from the standpoints of income, the number of consumers, and manpower... Half of the labour force is on welfare for six months of the year; their yearly incomes do not average $2,000. People cling to the region partly due to inertia and fear of the outside world.

Emigration is considerable. In fact, all the vital elements are being lost. It is the answer of the young to felt poverty. Deeply impressed by everything which seperates them from the urban standard of living, they will accept a foreign way of life in order to have access to a weekly pay cheque, paid holidays, and cars.

The vigorous response to the tension of the milieu is a systematic emigration at the age of 21. Emigration is facilitated by the fact that relatives, parents and friends and the same parish structure are met again in Gardner, Leominster and elsewhere... And during the July holidays they come and take away those who have stayed behind in jobs considered backward: fishing and agriculture.

The effects of the flow of emigration influence the demographic, social and economic structure. Due to the large-scale departure of the young parents, it may be feared that, within a short time, there will be a marked decrease in the birth rate and an aging population. Agriculture and fishing are in the hands of men whose average age is around 40 to 45 years...

Kent County has already played its main role in the occupation and civilizing of the territory. It is now merely a supernumerary in the economy of New Brunswick. In our contemporary urban and industrial world, the characteristics of its geographical milieu and its location are not in its favour. The milieu is harsh and almost repulsive for someone who was not born there. Leadership is out of the question. In this area, isolated by sea, marshes and forest, the community accept their poverty (although they reject the world) because it is shared by all and seems to be a lasting phenomenon.

(From Pierre-Yves Pépin, 1968, pp. 37-41.)

residents throughout New Brunswick. A large majority of respondents to the landholder survey (22 of 27) still thought young people must leave Kent to find work. Even those who did not think young people had to leave Kent County to find work tended to believe things were no better elsewhere, so there was really no reason to leave. Most local opportunities were seen in fishing (6 responses) and in the woods (5 responses), but a depressingly large number of respondents (11) thought local opportunities were rare, or did not exist. Thirteen respondents thought the rural economy of Kent County had declined over the past ten years, mostly because of less resource-based work.

Alternative economic opportunities are also liable to attract younger, more innovative people first and, as a result, generally erode the quality of an area's labour supply. In advertising parlance, the "movers and shakers" leave the area, and the population which remains contains relatively few members in the important, prime-age classes (aged 20-44). The age-sex pyramids for Kent County show this process quite markedly as time has progressed, particularly for 1961 and 1971 (Figure 4.2).

Comparing this age structure with that of Atlantic Canada and the nation as a whole emphasizes that Kent County lost a great deal of its prime-age people (aged 20-44) between 1951 and 1971 (Table 4.11). In 1971, for example, this age-group accounted for one-third of the Canadian population, about 30 per cent of the Atlantic population, but only 26 per cent of the people in Kent County. Younger people (less than 20 years old) were proportionately more important in the County up to 1971, and it is only in 1981 that an age structure relatively close to regional and national averages has been approached.

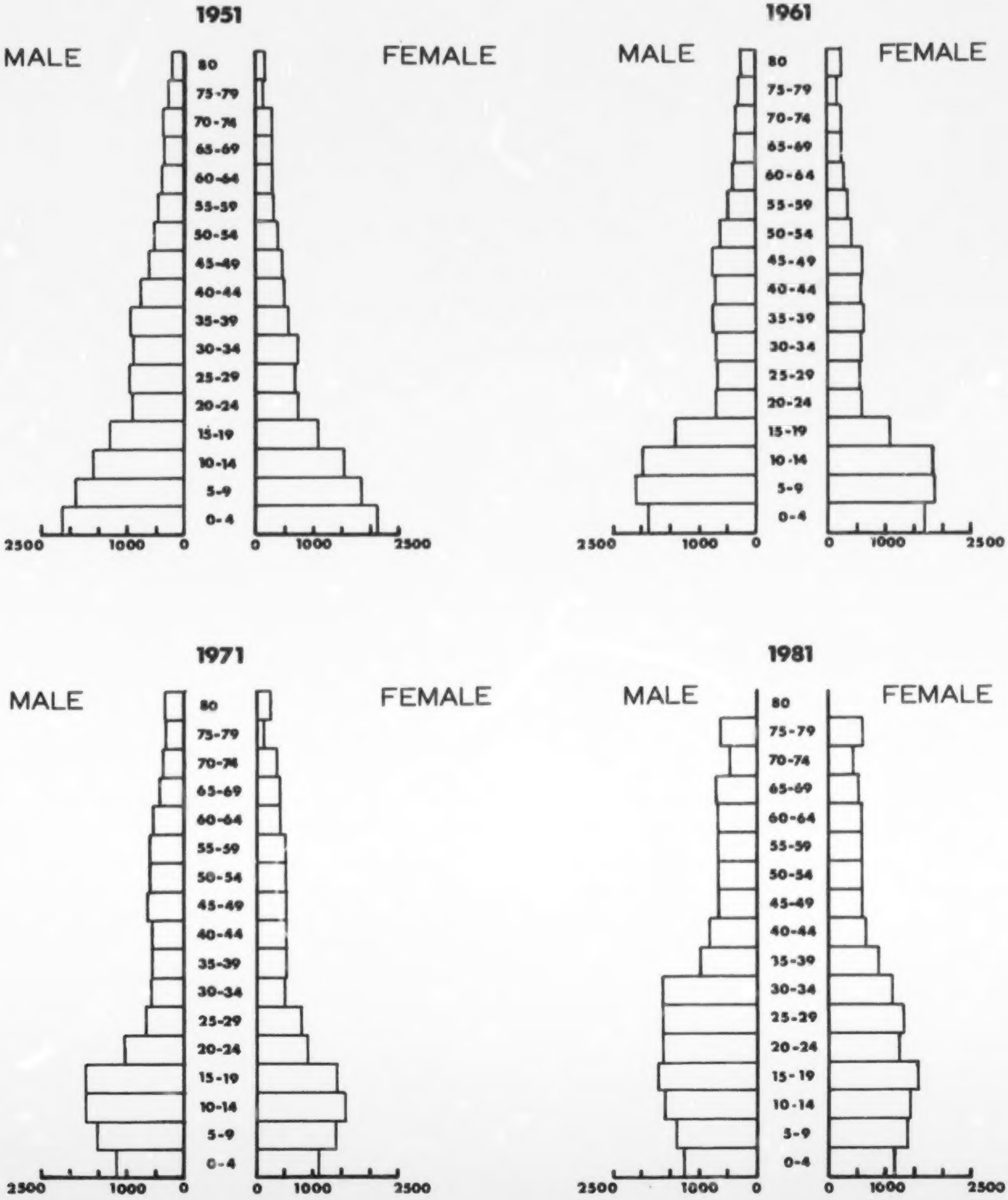
Figure 4.3 shows how this imbalance in population is also reflected in the age of farm operators in Kent County. In particular, those 60 years old or over tend to make up a significant proportion of farmers up to 1971. Only by 1981 is it evident that younger farmers have begun to play a more important role in Kent County's agricultural development, with close to one-quarter of all operators (24.6 per cent) 34 years old or younger.

A comparison of the proportions of farmers falling into the various age categories across Canada provides added evidence that younger people in Kent County left or avoided farming during the 1950s and 1960s. In 1951, 1961, and 1971 there was a significantly greater proportion of farmers less than 35 years old nationwide, and significantly smaller proportion 60 years of age or older, in comparison to Kent County. If we assume that the younger age groups contain the more innovative farmers, then Kent County was deprived of one of its most valuable agricultural inputs for the two decades beginning in 1951. Only in the 1981 census was the pattern established by the previous three censuses reversed, with a higher proportion of Kent County farmers falling into younger age brackets than occurred nationally.

Results from the Kent County survey tend to support the census with respect to age of the landholder. The majority of commercial farmers interviewed in 1982 were less than 50 years old, while the majority of non-farmers

FIGURE 4.2

AGE-SEX PYRAMIDS FOR KENT COUNTY 1951-1981



1951 · 1961 · 1971 · 1981

Source: Census of Population

TABLE 4.11

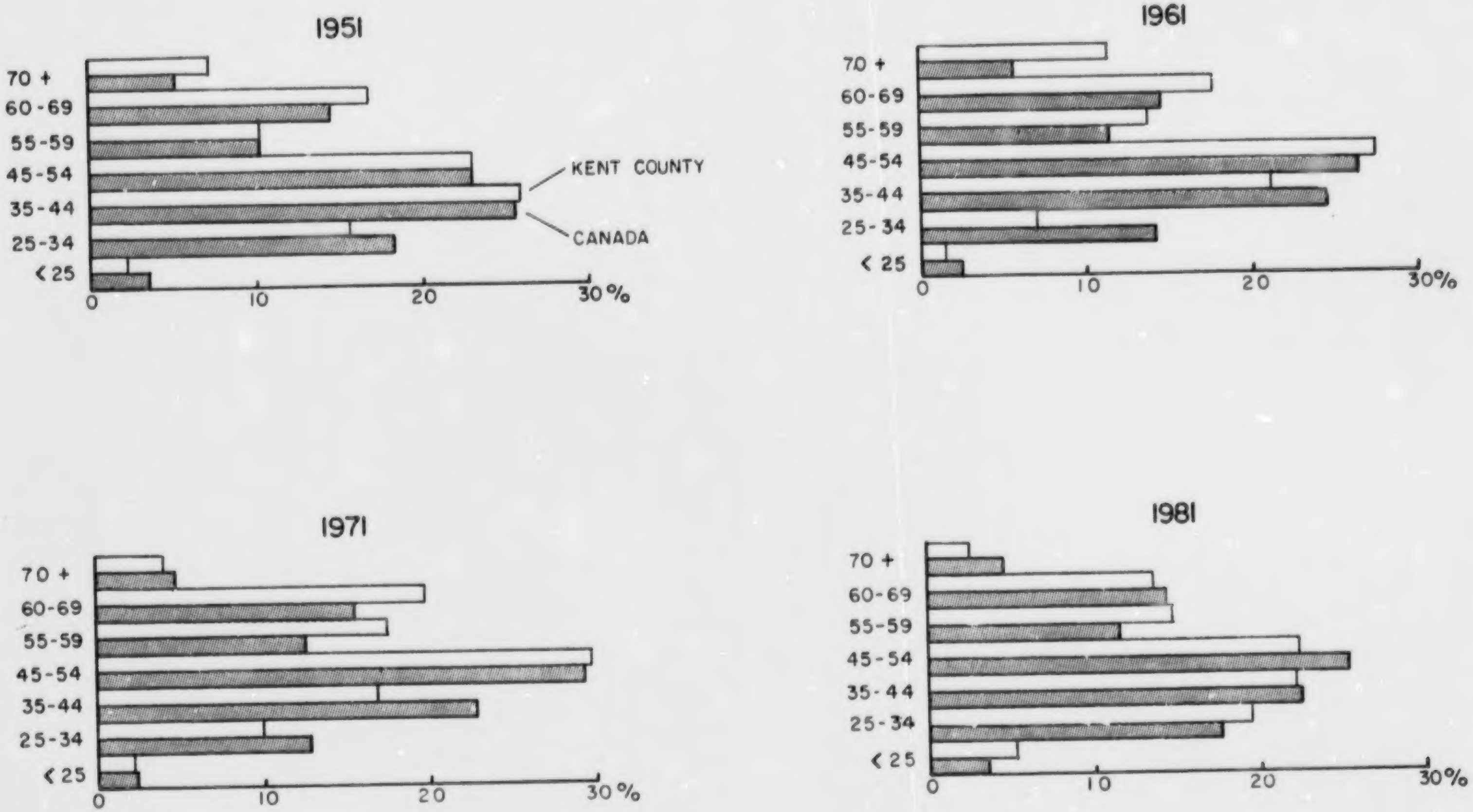
PROPORTIONS OF POPULATION BY AGE GROUP, CANADA, ATLANTIC CANADA, AND KENT COUNTY 1951-1981

	1951	1961	1971	1981
	- per cent of total population -			
less than 20 years old:				
Canada	37.9	41.8	39.4	32.0
Atlantic Canada	43.3	46.6	43.5	36.0
Kent County	49.9	51.7	46.4	37.0
20-44 years old:				
Canada	36.6	33.2	33.9	39.1
Atlantic Canada	33.4	29.5	30.5	36.8
Kent County	28.4	24.4	26.0	35.9
45-69 years old:				
Canada	20.8	20.0	21.5	22.6
Atlantic Canada	18.3	18.8	20.5	20.8
Kent County	16.1	18.1	20.7	20.3
70 years old and over:				
Canada	4.7	5.0	5.2	6.2
Atlantic Canada	5.0	5.1	5.5	6.4
Kent County	5.5	5.8	6.8	6.8

Source: Census of Population.

FIGURE 4.3

AGE OF FARM OPERATORS, KENT COUNTY AND CANADA, 1951-1981



Source: Census of Agriculture, 1951, 1961, 1971, 1981 or non-commercial farmers were more than 50 years old.

There is a complex cause and effect relationship between alternative economic opportunities and their influences on the rural economy, and this is perhaps one of the clearer examples of Myrdal's (1957) model of cumulative and circular causation in regional economic decline. Young people perceive little future in an area of declining rural activity, while higher-paying regular jobs open up elsewhere which, furthermore, offer the added attractions of urban lifestyles and amenities. As youth leaves, rural labour supply diminishes; this in turn erodes the ability of farmers to compete in an area of already low agricultural profitability, particularly because they cannot easily replace this labour with machinery because of lack of capital. To survive in agriculture, let alone to prosper, becomes an uphill task.

Changing Expectations and Attitudes

Although the population of Kent County has remained predominantly rural (almost 86 per cent in 1981, Table 2.12), this does not mean that the conveniences and amenities of modern urban living have passed over them. This "urbanization of rural attitudes" has meant that lifestyles of those who stayed in the County have approached more closely to the Canadian average, a process facilitated by improved communications and transportation (refer to McCuaig and Manning, 1982). More and more, rural dwellers are unwilling to be left out of the mainstream of modern living, and their expectations have changed accordingly.

Such expectations of an urban standard of living are reflected for trends in facilities and appliances reported by Kent County households. Table 4.12 compares the level of adoption of certain necessities and amenities at different levels in Canada by dwelling units in 1971. The necessities include such items as running water, bath or shower, and flush toilet. At least in comparison with rural dwellings in Canada, Kent County fared quite well, although it lagged behind slightly in the proportion of households with bath or shower and flush toilets. With respect to appliances such as a refrigerator, home freezer, electric dishwasher, television, and automobile, Kent County was close to, or exceeded, national or regional standards in 1971.

Even where the County lagged behind significantly in these lifestyle indicators, there was a marked improvement, sometimes a doubling in the amenity levels from 1961-1971. Limited data from the 1981 census also indicate that 96.1 per cent of dwelling units in Kent County had bathroom facilities compared to 98.7 per cent in Canada as a whole, 99.1 per cent in Saint John, and 98.6 per cent in Halifax. (In 1981, data on facilities and appliances were not collected at the same level of detail as in the 1971 census).

These material measures of the convergence of living standards between Kent County and national or regional standards complement the urbanized attitudes and values of modern rural living, which have become commonplace through at least two means. Firstly, Kent residents who have moved to other parts of North America to find work have often returned, either

TABLE 4.12

LIFESTYLES - CANADA, ATLANTIC REGION, KENT COUNTY, 1971

(Percentage of Households Possessing Facilities or Appliances)

	Total Occupied Dwelling Units	Running Water	Bath or Shower	Flush Toilet	Fridge	Home Freezer	Electric Dish Washer	Automatic Dryer	Tele-Vision	Auto-mobile	Owned Vacation Home
Canada	6,030,805	96.1	90.8	93.1	98.1	33.5	13.0	40.3	95.3	77.7	6.5
Urban	4,733,125	99.2	95.6	97.5	99.1	27.9	13.9	40.7	96.4	76.6	7.3
Rural	1,292,125	84.4	73.5	77.3	94.2	54.2	10.0	38.7	91.4	81.7	3.8
Non-Farm	964,255	85.4	74.0	79.0	93.4	45.1	9.5	36.1	90.9	78.9	4.3
Farm	327,425	81.7	72.0	72.0	96.4	80.8	11.3	46.2	92.7	90.0	2.4
Atlantic											
Region	503,470	89.8	78.3	83.7	92.8	27.0	5.2	26.9	93.2	73.0	6.5
St. John CMA (a)	28,680	97.8	91.7	96.5	97.9	15.0	4.9	25.4	96.4	74.2	9.6
Halifax CMA (a)	59,505	98.8	97.4	98.3	99.2	19.9	6.2	32.2	96.4	77.5	7.8
Kent County											
1961	5,043	54.2	26.3	32.5	48.6	4.2	(b)	(b)	65.5	47.9	(b)
1971	5,460	84.4	63.6	70.4	89.4	28.5	15.9	18.5	93.3	73.1	4.3

Source: Statistics Canada, Census of Population, Catalogue 93-525, 93-527 (1961), 93-735, 93-737 (1971).

Notes: (a) Two metropolitan areas nearest Kent County.
(b) Not counted in 1961 census.

during vacations or to live. Many still maintain a residence in the County although they may commute to work in Moncton. Expectations regarding lifestyle are usually enhanced by prolonged exposure to urban residence and/or work, and are naturally translated to the rural milieu at some stage. Secondly, many urban dwellers throughout southern New Brunswick can afford a vacation home. The sand beaches and other natural features of the Northumberland Shore in southern Kent County have attracted large-scale "seasonal suburbanization", which may be on a semi-permanent basis (when cottagers commute daily to work from their cottage) or on a weekend basis. The exposure of rural dwellers in Kent County to urban attitudes is thereby increased.

For those who currently remain on the land in Kent County, limited evidence suggests that the standard of living appears to have improved. Over one-half of the respondents to the limited landholder survey expressed satisfaction with their lot, and two were very satisfied (Table 4.13). Among those who expressed dissatisfaction with their standard of living, three did so on the grounds of hard work, low returns, or little security; the others were impatient because they could not devote as much time to their agricultural operation as they desired.

A measure of the widening scope of individual aspirations is also reflected in responses by landholders in the survey as to how they would spend a $10,000 windfall. The most frequent responses were that it would go either into the farm, into some kind of investment, or into a pension fund (eight responses each). But, five respondents would spend at least part of the windfall on travel. Even some of those who would devote the money to the farm qualified this by saying it would do little to reduce accumulated debt, so a preferred course might be to use it for more leisure pursuits.

Although the evidence is sparse, rising expectations and attitudes appear to have played a role in land abandonment in Eastern New Brunswick. This has occurred as demands for improved lifestyles have increased, and as rural residents have been more and more exposed to urban ideas and amenities. Either the farm operator has had some success in expanding or intensifying his operation to satisfy his increased expectations, as have many of the respondents in the landholder survey, or the farmer has partially or completely left the land in pursuit of urban employment.

The Effect of Government Programs

Although no more than a qualitative judgment on the effect of government programs in land-use change is possible here, it is evident that there has been an influence from this direction*. Programs and policies at all levels of government can be cited, and effects on land use have been both direct (or intentional) and indirect.

A broad range of government programs have affected the use of agricultural land in Kent

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*The information and assessments in this section are based substantially on interviews with professionals knowledgeable about agricultural and other land related conditions in Eastern New Brunswick.

TABLE 4.13

SATISFACTION WITH STANDARD OF LIVING

RURAL LANDHOLDER SURVEY, KENT COUNTY

Very Satisfied	2
Satisfied	14
Neutral	4
Dissatisfied	6
No Opinion	1
Total	27

Source: Maritime Resource Management Service, Landholder Survey.

County. Some, such as municipal planning legislation, have direct effects on land use, although they may not address agricultural land specifically. Others have been directed more specifically at the agricultural sector, and may include provisions to encourage land clearing, to bring individual operators up to levels of economic efficiency or to develop markets. All have had an impact on land use, although the nature and degree of this impact varies.

Municipal Planning. The principal instrument regulating municipal planning in New Brunswick is the Community Planning Act of 1972. This piece of legislation came several years after the Equal Opportunity Program abolished the previous system of county government. Many of the services in parts of New Brunswick, which became unincorporated as a result of this move, were taken over by the province.

The Community Planning Act operates at three levels, regional, district, and municipal. Ostensibly, there are opportunities for consultation at all levels with elected representatives. This has been difficult in most parts of Kent County (and elsewhere in rural New Brunswick) since county government was abolished. The Act only requires plans for certain incorporated areas. The remainder of the province (including both other municipalities and unincorporated areas) are given discretionary powers to combine into planning districts. Only one district has been formed in Kent County, and is administered by the Kouchibouguac Bay Planning Commission. It includes the municipalities of Rexton, Richibucto, and St-Louis as well as surrounding unincorporated areas. No municipal plan has been adopted within the district, and the Planning Commission only issues building permits and approves subdivisions.

Planning guidelines over much of Kent County, therefore, conform only to broad provincial standards, although these somewhat rudimentary standards represent the highest degree of planning ever achieved for New Brunswick rural areas. These include a minimum lot size in rural areas of 0.4 hectares. If pressures for urban and industrial development had been more intense, then this overall lack of municipal land-use planning would have exercised more influence on land-use change in Kent County. Equally, there may be more pressure for municipal planning to guide land-use change if development increased and the need arose.

Regional Development Policies. Federal programs to stimulate development in the Atlantic region and elsewhere date basically from the Royal Commission on Canada's Economic Prospects (the Gordon Commission) which reported in 1957. Since that time, there have been a number of regional development initiatives, some of which have directly affected agriculture.

The Agricultural Rehabilitation and Development Act (later modified to the Agricultural and Rural Development Act) was the first to affect agriculture directly in the 1960s. ARDA was not directed specifically at the Atlantic region, and the various programs it introduced, including farm consolidation and creation of community pastures, largely by-passed Kent County and did little to arrest the overall decline of agriculture. ARDA was mainly directed towards areas in the Maritimes with better prospects for agricultural survival and prosperity, and Kent's unfortunate reputation as a rural backwater of, at best, semi-commercial agricultural enterprises undoubtedly affected decisions to spend ARDA money elsewhere. (For further analysis on the impact of ARDA, see Buckley and Tihanyi, 1967). Allocations to Kent County under the program were minimal to the 1960s, although there was some development work on the St-Charles Bog in the northern part of the County, and on a community pasture near McNair in the south (McLaughlin, 1983).

ARDA programs were succeeded in 1969 by a new set of initiatives under the Department of Regional Economic Expansion (DREE). In general, there is an impression that DREE may have accelerated rural depopulation all over the Maritimes by concentrating on the "growth centre" concept. This emphasized general economic development in specified urban centres under the Special Areas Program (phased out after 1973). In so far as Moncton, for example, became a target for growth centre investments, movement of people from Kent County may have been indirectly encouraged.

In 1974, General Development Agreements became the main vehicle for delivering DREE policies to the provinces. Under a GDA, sub-agreements could be negotiated for specific sectors or areas. The most important sub-agreement to affect Kent County was the Kent County Pilot Project, which was signed in 1975 and ran for six years (McLaughlin, 1983). Under this pilot project, some 2,500 hectares of idle or reverting farmland has been reclaimed throughout the County, usually on behalf of proven commercial farmers. This project, it appears, is the first federal initiative to have a positive effect on the County's agricultural land base, and much of the work was done at a time when the rural economy in general showed signs of slight recovery after many decades of decline. As the timing of this project also coincided with a degree of agricultural resurgence in Kent County, and elsewhere in Atlantic Canada, most of the land affected is still in production.

Two other sub-agreements concerned agricultural development throughout New Brunswick; the first ran from 1975-1978, and the second from 1978-1983.* Combined authorizations for both sub-agreements have amounted to more than $45 million. The first sub-agreement was, from the outset, designed to set the stage for real gains in terms of agricultural production which would occur only after the second sub-agreement had begun, but detailed sub-provincial analysis is not available. Major expenditures province-wide were on the dairy sector (27.4 per cent of authorizations), mainly to encourage increased land quality; livestock feed (14.8 per cent of allocations), mainly to encourage replacement of western feed grains with locally-grown supplies; the beef sector (11.4 per cent of authorizations) mainly to encourage retention of beef heifers; and land development (10.6 per cent of expenditures), mainly for farmland improvements (clearance, tile drainage, fences, etc.).

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*Information in this section is derived from Canada, Department of Regional Economic Expansion, 1980 and 1983.

The second sub-agreement has endeavoured to build on this beginning. Grant payments over the first four years of this agreement, specifically for land clearing and drainage in Kent County, have amounted to almost $460,000, or almost 17 per cent of the provincial total for these specific purposes. Total payments in Kent County over the first four years of the program have been $1.3 million, or a little more than 8 per cent of the provincial total. Six main programs have been identified for funding, including agricultural resource development. It must be repeated that any effects of these sub-agreements have come fairly late in the game, after much of the rural decline in Kent County has claimed a good portion of once-cleared agricultural land. In this respect, as well, various programs in the sub-agreement have been for capital improvements to farms, especially for traditional types of enterprise such as dairy and beef. Usually, these programs have provided no more than half the funds required to invest in buildings and so on. The rest must be financed by the claimant, and evidence is emerging that during recent bouts of high interest rates these extra credit loads may have been too much for some farmers to carry. To the extent that farmers have been placed in a poor credit position and risk bankruptcy, the sub-agreements may have deterred agricultural growth in Kent County to a degree, instead of encouraging it.

Other Federal Programs. There are a broad range of federally funded or federally legislated programs which assist agriculture (e.g., Advance Payments for Crops, Agriculture Stabilization Payments, Crop Insurance, etc.), but the influence of such programs is limited in a semi-commercial agricultural area such as Kent County. Particularly helpful to Kent County farmers should be the agricultural research station recently established at Buctouche, which will facilitate the development of crop varieties and cultivation methods suited to the local soils and climate. The effects of other federal agricultural programs have sometimes not been as positive. Two are highlighted below.

The Small Farm Development Program was a joint effort between the federal and New Brunswick governments (signed in 1972) to foster the transfer of land to active farmers, and to provide an information and counselling service to assist farmers in running their operations. Up to 1976, only 14 vendor grants had been issued from the Moncton office for all of Eastern New Brunswick. Reasons for the program's substantial failure include its design to assist people leaving agriculture when most people in Kent County weren't interested in selling their land; it was aimed at enlarging farm holdings when any of the relative prosperity achieved in Kent County agriculture has come from intensifying the use of an existing land base; and the program has no concern for development of either agriculture or the community (Canada, Senate, 1976). In addition, the program was administered by the Farm Credit Corporation which has not had a very good reputation among Maritime farmers.

The Feed Freight Assistance Act is a 1941 measure which subsidizes the transport of western grain to Eastern Canada. The original purpose was to encourage the growth of an eastern livestock industry by providing feedgrains at prices close to those in the western provinces. It has mostly accomplished its aims in Ontario. But, its effect in the Maritimes and adjacent areas of Quebec has been to inhibit the planting of feed grains in areas where yields have traditionally been extremely good (Robinson, 1983). Land which would have been planted in grains in the absence of the Act has gone instead into pasture or has been abandoned from farming.

Provincial Policies. The New Brunswick Farm Lands Identification Program (FLIP) is designed to conserve agricultural land by deferring property taxes from any land registered under the program (see Furuseth and Pierce, 1982, for a general review of this type of strategy). It has been in operation since 1979 and over the four years to 1982 has covered about 7,500 hectares in Kent County. As with many other government initiatives, absence of such a program in earlier years may have stimulated the loss of land to agriculture.

Conclusion

The range of economic circumstances since the 1950s, tied to changing individual attitudes and aspirations, in Kent County has combined to influence rural land-use change quite profoundly. Lack of competitiveness on the part of the individual farmers came largely as Maritime agriculture underwent big changes from a largely subsistence to a commercial operation. More specialization was required, and this required greater amounts of capital. Generally, this kind of capital was rarely available to most farmers in Kent County given a tradition of agricultural productivity lower than most other areas of the Maritimes.

As rural agricultural decline gathered pace, alternative employment opportunities presented themselves, usually away from Kent County. A sustained wave of emigration began which further accelerated the erosion of the agricultural base, and this wave only slowed in the 1970s. This emigration usually involved young people who, in themselves, are a valuable resource. Both the quality and quantity of agricultural management and labour were reduced. This cumulative impact of rural decline in terms of emigration was aggravated by decline in other respects; infrastructure deteriorated, as fewer farms required services, surviving farms became fragmented as the land market did not function well, and individual attitudes and expectations became urbanized, resulting in fewer and fewer people who were willing to work the land for low and uncertain returns. The combination of all these factors contributed to further decline.

In general, the late 1970s have seen a degree of recovery in rural Kent County as those farm enterprises which survived the social, economic and technological changes of the previous 25 years have generally become modern commercial operations. This mild prosperity has come on the heels of specialization, intensification, careful expansion in line with available markets, and improved agricultural extension services and farmer skills. Much of the damage done to rural areas in previous years, however, both in terms of land lost to agriculture, and decline of the rural community, is irreversible. Only the significant area of recently abandoned farmland (5182 ha in the study area), which is idle but still cleared, represents a ready reserve for agricultural expansion. And the longer this is left untended, the less of a reserve it becomes.

CHAPTER FIVE

INDIVIDUAL DECISIONS AND RURAL LAND-USE CHANGE IN EASTERN NEW BRUNSWICK

External factors create a set of circumstances within which a landholder can manoeuvre. These external factors include profitability of agriculture, markets, farmer skills and management, supply of agricultural labour, and changing expectations and attitudes on the part of rural dwellers; these, and other factors have been discussed in Chapter Four in the context of rural decline in Eastern New Brunswick. The extent to which a landholder, and particularly a farmer, manoeuvres within this framework, however, is largely determined by internal conditions, such as type of land owned, degree of skill, training in agriculture, ability to raise credit, and individual outlook. A substantial degree of individual judgment of current and foreseeable circumstances will determine whether that decision-maker's land stays in agricultural use or not.

A simple model of the way external and internal factors interact for an individual landholder has been devised by McCuaig and Manning. According to them:

> "... any given (external) factor influencing land use in a region is filtered through the perceptions of an individual decision-maker who weighs all the circumstances according to his personal aims and objectives ... Internal conditions are what separate those who choose to enlarge and capitalize from those who elect to remain static or withdraw from farming." (McCuaig and Manning, 1982, 141).

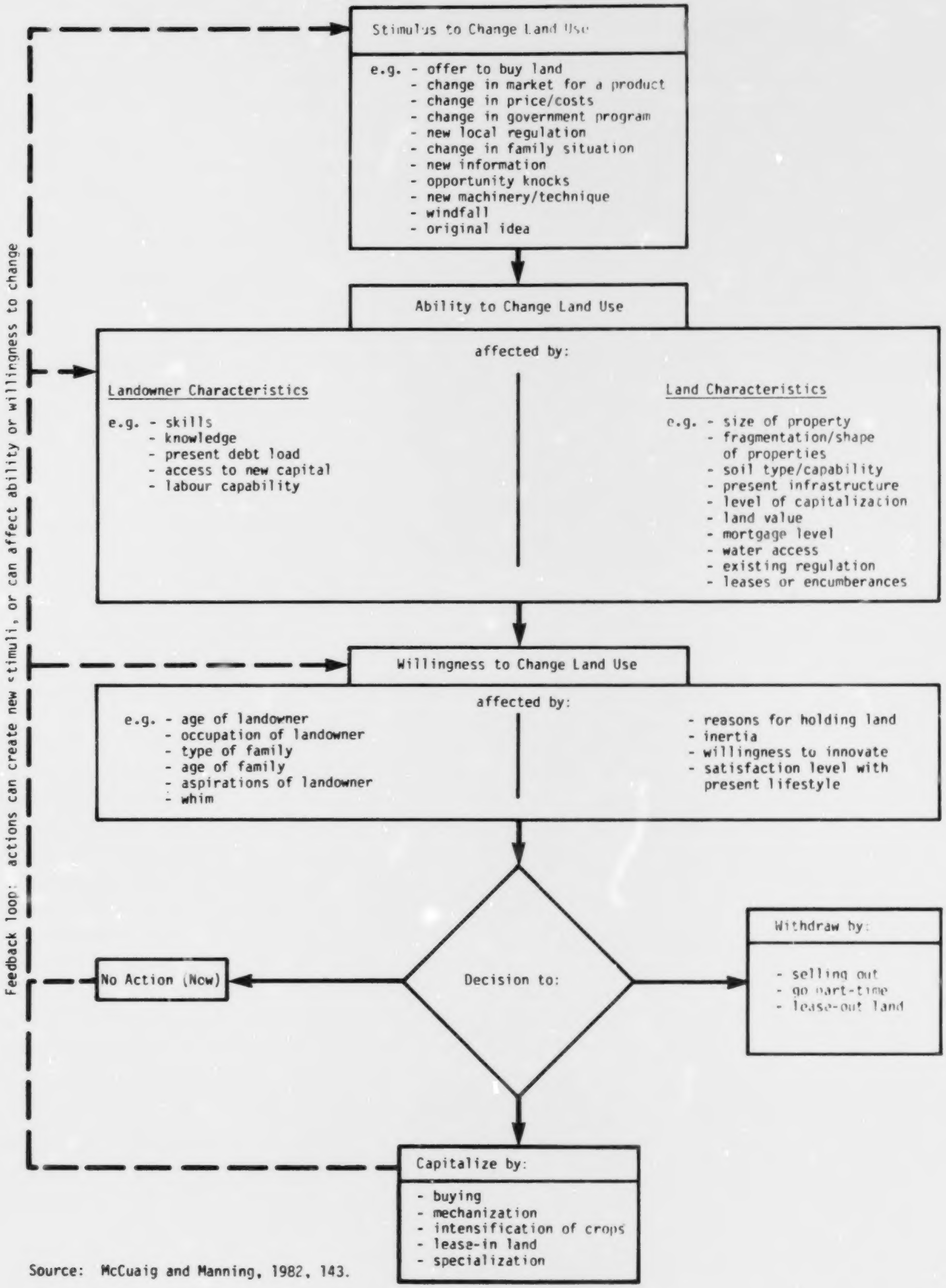
The concept of external and internal forces which combine to influence individual decisions which, in turn, direct and determine the degree of rural land-use change has been summarized in Figure 5.1.

A qualitative judgement of the intensity of the relationship between external, or causal, factors and various aspects of land-use change as observed in Eastern New Brunswick is provided in Figure 5.2. The most important single factor which has prompted rural change in the area has been lack of agricultural profitability, with other important influences coming from aspects of the land market and markets for land, markets for agricultural products, technology and mechanization, farmer skills and management and supply of agricultural labour. Other factors have had more particular effects in reducing the area of land being farmed, such as alternative economic opportunities and changing expectations and attitudes. Both deprived agriculture of some of its most promising participants in Kent County.

As McCuaig and Manning point out, landholder responses within this framework of external causal factors are tempered in the first place by ability to respond, and in the second place by willingness to respond (Figure 5.1). The ability to respond to an opportunity or a change may be related to the property in question, whether it is too small, fragmented, or has poor quality soils which inhibit adoption of machinery or other techniques of modern, economically efficient agriculture. As well, credit facilities may not be well developed, along with other infrastructural aspects of a locality, and individual management skills may inhibit risk-taking. The willingness to respond, even given a

Figure 5.1

The Decision Process for Rural Land Use Change: A Simple Model


Stimulus to Change Land Use
e.g. - offer to buy land
- change in market for a product
- change in price/costs
- change in government program
- new local regulation
- change in family situation
- new information
- opportunity knocks
- new machinery/technique
- windfall
- original idea
Ability to Change Land Use
affected by:
Landowner Characteristics
e.g. - skills
- knowledge
- present debt load
- access to new capital
- labour capability
Land Characteristics
e.g. - size of property
- fragmentation/shape of properties
- soil type/capability
- present infrastructure
- level of capitalizacion
- land value
- mortgage level
- water access
- existing regulation
- leases or encumberances
Willingness to Change Land Use
affected by:
e.g. - age of landowner
- occupation of landowner
- type of family
- age of family
- aspirations of landowner
- whim
- reasons for holding land
- inertia
- willingness to innovate
- satisfaction level with present lifestyle
Decision to:
No Action (Now)
Withdraw by:
- selling out
- go part-time
- lease-out land
Capitalize by:
- buying
- mechanization
- intensification of crops
- lease-in land
- specialization
Feedback loop: actions can create new stimuli, or can affect ability or willingness to change

Source: McCuaig and Manning, 1982, 143.

FIGURE 5.2

INTERACTION OF CAUSAL FACTORS AND ASPECTS OF RURAL LAND-USE CHANGE IN EASTERN NEW BRUNSWICK

CAUSAL FACTORS (Chapter 4)	Stay in Agricultural Use				Transitional		Lost to Agriculture	
	Intensify	Specialize	Diversify	Enlarge (Lease in)	Lease Out	Part-time Farming	Leave Idle	Change to Other Use
Market for Land and Land Market	x	o	o	x	x	x	x	x
Agricultural Profitability	x	x	x	x	x	x	x	x
Technology and Mechanization	x	x	o	x	o	o	o	x
Markets	x	x	x	x	-	o	x	x
Skills and Management	x	x	x	x	o	o	x	x
Labour Supply	x	x	o	o	x	x	x	x
Infrastructure	o	o	-	-	o	-	o	-
Alternative Economic Opportunities	o	o	-	-	x	x	x	x
Changing Attitudes and Expectations	o	o	o	o	x	x	x	x
Government Programs	o	o	o	o	-	-	-	-

x Major impact
o Secondary impact
- Little or no impact

degree of economic capacity and management ability, may also prevent the change-over to a more efficient farm operation. The age of the farm operator may affect willingness, as well as having children prepared to carry on with the farm. Other ambitions, or the availability of other means of making a living will also affect willingness to improve or expand the farm.

Throughout this study there appeared evidence of the willingness to respond among Kent County landholders being severely reduced by the ability to respond. A variety of circumstances such as lack of credit facilities or agricultural markets, based in turn on overall lack of profitability in agriculture in Kent County, has severely inhibited young people's desire to remain in farming. Willingness to respond was further eroded as alternative economic opportunities, (which offered more secure financial prospects) arose elsewhere.

Reasons for Leaving Agriculture

Reasons to quit farming can partly be couched in terms of the attitudes and lifestyle aspirations of individuals. Almost simultaneous with rural decline in Eastern New Brunswick, and the relative increase in economic opportunities elsewhere, there has been a change in attitudes and outlook. This has further influenced individual decisions on disposition of landholdings. The 1960s and early 1970s were a period of rapidly increasing personal incomes and mobility throughout North America. As the results of this new affluence reached more remote parts of the continent (which must include most rural areas in Atlantic Canada), the inhabitants of these more remote parts became less and less willing to be left out of the mainstream of unban-style living and amenities (Ricour-Singh, 1981; McCuaig and Manning, 1982).

Simultaneously, alternative employment in nearby urban centres provided the increased economic opportunity which allowed many people to combine rural living with an urban wage packet, or allowed them to own rural property for recreational purposes. In circumstances such as these, an uncertain future in agriculture plagued by low profitability and fluctuating incomes often proved less attractive in spite of a very strong attachment to the land on the part of inhabitants in Eastern New Brunswick.

The change in attitudes has affected individual reasons for holding land. Respondents to the landholder survey reported a variety of reasons for originally holding land in Kent County, but the most important was to make a living, closely followed by residence or shelter (Table 5.1). Lifestyle influences were also strong in the original reasons for owning land. As time has passed, however, lifestyle has become the most important single reason for owning land in the County, and making a living from that land is much less important in the 1980s than in earlier times.

As mentioned earlier in this chapter, many individuals left Kent County rather unwillingly; willingness to respond to changes in external circumstances was far outweighed by ability (or inability) to respond. Even amongst those who left the area there have been people who returned after various lengths of time away. This trend has followed several

TABLE 5.1

REASONS FOR OWNING LAND, RURAL LANDHOLDER SURVEY, KENT COUNTY, 1983

Reason	At First	Now	Most Important Now
Making a Living	23	14	4
Investment	4	5	-
Residence/shelter	20	13	1
Lifestyle	19	23	17
Retirement	3	4	3
Desire to Own	6	9	1
Inheritance	12	2	-
Total	-	-	26

Source: Maritime Resource Management Service, Landholder Survey.

Note: Other reasons noted included recreation, develop potential in farming, create jobs, and leave to family.

basic patterns. Those who did not stay away for long could not accept the contrast in lifestyle in their new milieu, or were simply homesick. Those who survived the first shock of their new surroundings, and stayed away much longer, were able to build up a reserve of savings which enabled them to consider returning to their homes in Eastern New Brunswick. This may have been to set up a small business, or to retire to land which remained in their family.

This attachment of the land is still evident in Eastern New Brunswick. Ten of 27 respondents to the landholder survey said they were committed to farming, and had always wished to work the land in Kent County. Some had actually left the area, only to return as inclination and personal circumstances allowed. The lifestyle these people had chosen in Kent County may have involved considerable personal sacrifice, but over one-half of the 27 respondents surveyed expressed satisfaction with their lot, and two were very satisfied (Table 4.13).

It appears that there is a little more flexibility in decision-making in Kent County in the early 1980s than there was in the past, and this is mainly due to changed circumstances and a changed outlook. In earlier years, when land abandonment characterized Eastern New Brunswick, most decisions were forced by external economic circumstances and the need to make a living. This usually precluded much consideration of trying to farm for a living in an area of traditionally poor commercial agricultural performance. Many farmers, as a consequence, abandoned agriculture as a way of life and undertook other economic endeavours. Leaving the land often represented an unwilling acceptance of an inevitable course of action, and as time and circumstances have permitted, many people who left the land in Kent County have returned.

Strategies for Remaining in Agriculture

Agriculture prosperity is possible in Eastern New Brunswick, based on the same range of alternative strategies which farmers elsewhere have adopted to meet new conditions. These include farm enlargement, intensification, specialization, diversification and part-time farming. The means to address these challenges have only recently gained a substantial foothold in the region, and the farmers who have successfully adapted to rapidly changing conditions since the early 1960s now form the core of a relative agricultural prosperity in Kent County. Many of the strategies have already been addressed, at least in part, in previous chapters. Further brief examination of each of these strategies reveals their role in surviving the agricultural decline of the past two or three decades in the County.

Enlargement of Operation.

Larger farms in Kent County tend to be in the hands of commercial farmers. The achievement of scale has been accomplished by a variety of means, usually less by purchasing and more by leasing of land from others (Table 4.2). This may produce inefficiencies in that the land market rarely allows purchase or lease of adjacent properties, and fragmentation of operations has resulted.

There are also indications that enlargement of individual operations will continue to play a part in Kent County agriculture to the extent it is possible. Six of the 27 survey respondents said that they intended to expand the size of their holdings over the next five years. Enlarging in the past, however, has been a difficult and complex business given lack of credit, an extremely sluggish land market, and overall lack of agricultural profitability. In part, these have been overcome in Eastern New Brunswick by cooperation between producers.

Specialization and Intensification of Enterprise. Enterprise specialization within an existing land base is an alternative, or a prelude, to enlarging the farm by purchase or lease. This may also involve more intensive use of that land by clearing or other improvements. There was a trickle of improvements in the 1960s, and this flow increased in the 1970s as farmers improved their overall management of the operation, as credit markets improved, and as certain government programs became more effective (Table 4.7). Specialization has usually involved new types of enterprise for small, but stable markets, or a movement away from the older style mixed farm into production of a narrower range of crop or livestock commodities. The former of these especially has proved to be a successful strategy for those relatively few farmers who decided to grow crops such as tobacco, Brussels sprouts, and other fruits or vegetables. Much of the aggressiveness which lately has come to characterize Kent County farmers originates with these non-traditional enterprises. Given the relatively limited market opportunity and rate of growth, however, the growing of specialty crops is an option for a fairly small group of farm operators, particularly the innovators who entered the new specialties first.

Diversification. Enterprise diversification can take two basic forms, producing a wider range of commodities, and combining agricultural income with other resource-based income. The former of these is, ironically, quite a natural outcome of specialization in that some specialist crops are in rotations with other crops, some of which themselves are cash crops. Tobacco farmers grow grain as part of their rotation, Brussels sprout farmers may grow beans as part of their rotation. Several of those surveyed had plans for a more diverse range of products from their land, including blueberries and other types of fruit production. Other landholders were also establishing more diverse markets, usually trying more direct selling to consumers by such means as roadside stands, U-pick operations, or farmers' markets.

Currently, there is limited diversification of farming with other resource-based activities, which was historically tied to a pattern of seasonality characteristic of Maritime farming. Traditionally, a subsistence farm operation involved a triangle with the fields, the woods, and the sea as the apexes. Nowadays, this seldom occurs. Indeed, among respondents to the landholder survey, only one commercial fisherman had farming as an adjunct to his fishing income, and one lumberman split his time between the farm and the woods over the work-year.

Production and sale of forestry products from farms in Atlantic Canada has been relatively more important than nationally, although this importance has declined since 1951 (Table

5.2). Presumably, this decline reflects more agricultural specialization, although farmers who have continued to sell forest products, have generally increased their output of such items as pulpwood or sawlogs. In Kent County, those farmers who sold forest products in 1951, had incomes on average of $266, higher than either regional or national averages. Since this date, the value of forestry sales in Kent County has increased in nominal terms (to $1,529 per farm reporting in 1981), but values at both national and regional levels have increased much more rapidly. Although in theory, landholders in Kent County are well located to supply pulpmills and sawmills with wood, and given a tradition of lumbering in the County, the forest resource has not apparently been much of a factor in facilitating the diversification of farm enterprises.

Only five out of 26 respondents to the landholder survey who reported a woodlot as part of their holding derived income from this source in 1981. The woodlot income of three of these, however, was insignificant. Mostly, work in the woods involved selective commercial cutting, or for firewood. The general conclusion is that this form of diversification has not, and does not, impart much extra flexibility to the landholders' decision-making process.

Part-time Farming. There are several factors which characterize part-time farming. It can be either a means to leave agriculture, to enter agriculture, or to facilitate expansion. It can also mean either husband or wife, or both, working off the farm (refer to "It's tough keeping the farm going, but this couple loves it."). For those seeking to make a living off the land, part-time farming can be a frustrating experience. The main priority is the farm itself, but other work usually provides a substantial proportion of total income and a means of ready cash to sustain the farm.

Census data reveal that the extent of off-farm work in Atlantic Canada has usually been higher than in the nation as a whole, although the gap has tended to narrow since 1951 (Table 5.3). In 1951, off-farm work in Kent County was undertaken by 44 per cent of all farm operators, compared to almost half (49.5 per cent) of all Atlantic operators and a little more than a quarter (27.6 per cent) of all Canadian farmers. Terms of off-farm work in Kent County were mostly between 25 and 156 days in length, probably reflecting seasonal patterns. About three in five Kent farmers (60.7 per cent) had off-farm work in 1981, while the corresponding figure for Canada as whole increased to two farmers in five. Medium term employment off the farm still predominated in Kent County, unlike the region and the nation. Longer term employment (more than 156 days in a year) also increased markedly in Kent County and was undertaken by almost one in four farmers (24.6 per cent). This high proportion of longer term off-farm employment probably reflects, in part, a back-to-the-land movement of people who still maintain jobs in towns and cities. There were a variety of other occupations reported by respondents to the landholder survey, including seven who worked at endeavours secondary to farming; these included forestry, trucking and construction, but in most cases the secondary occupation contributed less than one-quarter of the total household income. Of those surveyed who were part-time farmers (six in all), half said their operation was not big

TABLE 5.2

FOREST PRODUCTS PRODUCED ON FARMS, CANADA, ATLANTIC CANADA, KENT COUNTY 1951-1981

	1951	1961	1971	1981
Farms reporting (% of all farms)				
Canada	37.7	28.6	6.8(a)	6.2(a)
Atlantic Canada	60.7	51.4	22.8(a)	21.4(a)
Kent County	81.7	70.8	28.9(a)	18.6(a)
Average Value Sold per Farm Reporting ($)				
Canada	161	204	(b)	3273
Atlantic Canada	256	303	(b)	3437
Kent County	266	255	(b)	1529
Pulpwood Sold per Farm Reporting (cords)				
Canada	5.2	6.2	30.2	(b)
Atlantic Canada	9.7	12.7	46.5	(b)
Kent County	16.0	16.9	25.7	(b)
Sawlogs Sold per Farm Reporting (board feet)				
Canada	1580	1695	4869	(b)
Atlantic Canada	2618	2878	3413	(b)
Kent County	510	711	2276	(b)
Farms Reporting Maple Tappings (% of all farms)				
Canada	4.6	4.6	2.7	3.8
Atlantic Canada	0.7	0.9	1.0	2.5
Kent County	0.4	0.5	1.2	1.6

Source: Census of Agriculture.

Notes: Dollar values in nominal terms.

(a) In 1971 and 1981, the proportion of all farms reporting forest products refers to those farms which sold forest products.

(b) Data not reported for these censuses.

It's Tough Keeping A Farm Going, But This Couple Loves It

By VERA AYLING
Correspondent

McKEES MILLS, Kent County — Despite a love of the land, many young farmers are forced to struggle to maintain their homesteads.

Many work off the farm for a supply of ready cash.

Strangely enough, however, they love both their jobs and wouldn't trade places with anyone.

Glenn and Jo-Ann Hicks of McKees Mills, Kent County, are just such a couple.

They work at separate jobs in Moncton to support their farm and beef operation. Even so, they say their salaries are spread pretty thin.

This month Glenn began his third term as president of the New Brunswick Shorthorn Association, a position he says that provided "a most valuable learning experience."

Each month the couple pay on a loan to purchase the 100 acre family spread, called Long Lane Farm, from Glenn's retired father, Jack. They also have two children to support: Corey, who is 7, and in French immersion at Moncton's Forest Glen School, and five-year-old Carla, at home in the care of her grandparents.

On top of that there is feed for their 30 head of shorthorns, fuel for their tractor and other farm equipment. Plus the cost of buying bulls to improve their stock, which runs anywhere from $1,500 to $2,000 or more, each.

Senior Champion

"I've bought bulls in Ontario the last couple of years, and I had the Senior Shorthorn Champion at the Maritime Winter Fair in 1982," Mr. Hicks says. "Last year I had 16 good calves. I tried artifical insemination, but the calves either came too early or too late. Usually I sell a bull after two years to another farmer, or for freezer beef; sell a few of the older cows, too."

He claims he is selling cattle for almost the same price as when he started, and like other beef producers, feels the competition from pork and poultry producers.

"We need more beef promotion here," he insists.

Contrary to what most consumers believe, he says Maritime beef is on a par with western beef. "The longer beef hangs, the more tender it is, and I think westerners hang theirs longer than people do here." His own animals are slaughtered in St. Mary's and are hung seven days before going to market.

Besides 25 acres of woodland, which supplies firewood for the farm and some logs, Glenn cuts mainly for his own use today. "I had to put a new end on the barn this year and it is nice to have a supply of my own 2x4s. We have a two family apartment-style home, with my parents on one side. Dad works some around the farm, but he is getting older now. We can't afford to hire outside help, and it is hard to get."

To cut down on expensive imported feed, Mr. Hicks grows 12 acres of corn silage and 20 acres of oats and barley for his cows, and spends an extra $200 per month to feed his bulls and heifers on test.

Easy To Handle

He keeps his cows in the barn until spring, but the bulls have an outside pen as well. He says shorthorns are easy animals to handle and he has been very lucky with his bulls. . ."only a little trouble getting them into the barn each fall."

Off the farm, Mr. Hicks works as a foreman at the L.E. Shaw Ltd. Concrete Pipe Plant in Moncton's Caledonia Industrial Park, and has been there close to seven years.

"The company started a profit sharing plan not long ago and I'm nearly up to the goal of $500 now," he said. "The company is good to us. We have six working there this winter."

Glenn adds that it gets "rather rough working in the summertime during the haying season on the farm." He rents three other farms for hay land and keeps them seeded with timothy and clover. However, he has weekends free from work at the cement plant and he puts them to good use on the farm.

His wife, Jo-Anne is a clerk in District 15 School Board office. She helps with the haying and with weeding of the family's vegetable garden. Then she has the usual pickling and preserving for winter use.

The couple drives in a car pool each working day to Moncton, leaving their home at 7 a.m. They get back home at 5:30, and after dinner begin their farm chores. Mr. Hicks, spends two hours each night in the barn.

"My Dad was never in the beef business. He drove a school bus, starting out in his own car with six children. He went to one small bus and ended up driving a regular school bus with 64 kids," Explains Glenn. "He has been retired quite a few years now."

Sometimes, Mr. Hicks says he gets discouraged, "but then, it is worth everything, when I see the new calves coming. I benefit as president of the Association, too, by promoting shorthorns, showing cattle and talking to breeders.

Good Land Base

He insists that Kent county has a good land base for farming and that there is a lot not being used which could be productive and profitable.

"When the old people go, no one stays on the farm anymore. More often it is sold and just becomes a place for summer for city people.

"Unless a farmer has a good job outside, it is becoming harder to run a farm, and there is not much encouragement to keep a son on the land."

(Telegraph-Journal (Saint John) 19 January 1983)

TABLE 5.3

OFF-FARM WORK, CANADA, ATLANTIC CANADA AND KENT COUNTY, 1951-1981

	1951	1961	1971	1981
	- per cent of all operators -			
Canada				
Operators reporting any off-farm work	27.6	32.0	35.3	38.7
Less than 25 days	5.0	4.0	4.8	4.1
25 to 156 days	12.9	13.4	12.8	12.5
More than 156 days	9.7	14.5	17.7	22.1
Atlantic Canada				
Operators reporting any off-farm work	49.5	47.6	41.4	43.6
Less than 25 days	6.2	4.8	4.4	3.1
25 to 156 days	23.7	19.9	15.0	14.6
More than 156 days	19.6	22.9	22.0	25.9
Kent County				
Operators reporting any off-farm work	43.9	54.2	43.1	60.7
Less than 25 days	4.3	6.6	5.0	3.2
25 to 156 days	26.1	28.8	19.9	32.9
More than 156 days	13.4	18.9	19.2	24.6

Source: Census of Agriculture.

enough for full-time work, and they were working to increase the farm to a viable scale.

A variety of part-time strategies emerged from the questionnaire survey. Some landholders were painstakingly building an operation up to the point of full-time viability, occasionally in partnership or cooperation with other joint-holders. Extra income came not only from their own off-farm work, but that of other family members such as wives. At the other extreme were those who derived most of their income from full-time work off the farm. Sometimes these respondents would be approaching the end of their work-lives as farmers, and income from the land-based enterprise had become an adjunct to income from other work. In between were such examples as "subsistence" or hobby farming, and one example where a farmer was building up a small operation for one of his children.

Personal Factors Affecting Decisions

The characteristics and circumstances of individuals will also affect the decision to continue or abandon farming. Several stand out from the responses to the landholder survey*.

Age. The most successful commercial farmers, and those building up relatively new operations, tended to be younger, less than 50 years old and often less than 40. These were the respondents who also tended to be running newer types of enterprises, such as specialist crops, or bigger operations. Conversely, those landholders with farms reverting to forest, or at best, leased to other farmers, were usually older.

Year of First Acquisition of Land. Length of landholding can become a potent influence in some decisions affecting land use, such as whether to sell or not. Roots in the area become firmly entrenched. More than half (17 out of 27) the respondents indicated the land had been in their families since before 1960, or roughly the start of the period covered by the land-use survey. A dozen indicated landholdings beginning before 1950, with only five acquiring their land since 1970.

The longer a piece of land stays in a family, particularly if the period of time involves some disruption such as actually abandoning farming as a way of life, the less likely a farmer is likely to want to sell. In general, the longer the tenure of a piece of land, the more likely the enterprise would be relatively small in scale and/or involved in traditional enterprises such as dairying or beef-rearing. Conversely, the bigger operation, especially if specialized crop growing was involved, the more likely the land had been acquired since 1970. These were also the farmers with definite plans to expand. Variations on these themes involved part-time farmers at the opposite ends of a spectrum: those struggling to build up an operation had acquired the land recently; those phasing down an operation tended to have owned the land much longer.

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*No detailed cross-classification of survey data are possible due to the limited number of respondents (27 in all). The comments in this section are qualified accordingly.

Family Circumstances. Cultural and religious factors in Kent County mean that families tend to be bigger than the national average. Census statistics reveal that families in Kent County in 1951 averaged 4.9 members compared to a national average of 3.9 members. Although this average family size has declined to 1981, the differential between Kent County and Canada remains at 3.6 and 3.3 members respectively. The larger a family is, the more optimistic a farmer is that one of his children will continue on the farm. Of the 27 respondents to the survey, 24 remarked that the farm or land would remain in the family, and in many cases, respondents had devoted large parts of their lives to ensuring that one or more of their children would have a thriving enterprise to take over when the time was right. In the past, however, these plans had miscarried if the father held on to title to the land, and had dominated the decisions affecting operation of the farm, until the children were middle-aged. Many younger people left before this occurred.

Aims of Landowners. As mentioned earlier in this chapter, many people who left Kent County to work elsewhere did so unwillingly, their futures in large part being dictated by external factors. The perception that the resource base for agriculture in Kent County was fundamentally good persuaded many to remain in the County, or to return after varying periods of time away. Those who did stay usually still worked the land but frequently took other jobs as well. It has been emphasized several times already in this report, but is worth repeating again, there are strong bonds to the land in Kent County and these have influenced decisions to keep on farming. Lifestyle was the most frequently cited reason for holding land in the early 1980s (see Table 5.1) and this usually reflects a desire to be independent and work the land.

Individual Decisions: A Summary

The mood of respondents surveyed as regards long-term outlook for land in Kent County varied from guardedly optimistic to qualifiedly pessimistic. Most respondents had definite hopes that their farm would be maintained in agricultural use after they stopped farming. There were qualifications on this in that much depended on markets and reducing debt. The more specialized, less traditional types of enterprise, such as vegetables or tobacco were run by people who were more firmly optimistic about the future, and professional personnel tended to share the same ideas. There were, in addition, several views that the worst was over in rural Kent County and that a measure of prosperity was ahead. These views were occasionally coupled with the opinion that things elsewhere were certainly no better, so in a relative sense Kent County was doing quite well.

In general, the mood of the early 1980s is one of hope. This is a relatively recent phenomenon and cannot easily make up for the aggregate decisions of earlier years which saw many people in Kent County unable, rather than unwilling, to make the changes necessary to preserve their agricultural lifestyle. Kent County is typical of many areas of the Maritimes in that wider forces have meant substantial rural emigration. Individual desires in this scheme of things have taken second place unless there has been a willingness to sacrifice a degree of financial security for a degree of lifestyle satisfaction. Apparently, "one can take the boy out of Kent County, but one can't take Kent County out of the boy". Many people who left did actually aspire and contrive to return. Many more, however, left and made permanent homes elsewhere as economic opportunities beckoned, and to the general detriment of agricultural land use in Kent County.

CHAPTER SIX

THE AGRICULTURAL USE OF MARGINAL LAND: LOCAL, REGIONAL AND NATIONAL PERSPECTIVE

This report has documented findings from a case study of land-use change processes in Kent County, New Brunswick. It has allied actual land-use change data derived from a survey of cleared or once-cleared land to a wide array of information on factors and attitudes influencing decisions in the study area based on the landholder survey and interviews with professionals. The study builds from an analysis of the decisions of individual landholders to a review of the cumulative result of such landholder decisions for the nation.

Decisions of individual landholders have accumulated in Kent County to contribute to the diminishing use of land for agricultural purposes, and an overall decline in the economic vitality of the rural milieu. The decline has been under way largely since 1951. As agriculture became more commercial and competitive in the 1950s, 1960s and 1970s, this decline accelerated in an area not noted for its farm profitability. Many people left the area, not always willingly, to find work elsewhere. The net result of this lengthy process has been a marked reduction in the County's agricultural industry. Most of the land removed from farming has not been converted to other uses, but has merely been idled or has actually reverted to woodland. In some cases this process of abandonment has undoubtedly been justified in terms of the low quality of the land for agriculture. In most cases, however, it appears that abandonment actually involved substantial areas of good capability land.

Land quality is only one aspect of agricultural production, however. A farmer must also be able to sell what he grows at a price which assures him sufficient income to cover both his capital and operating costs, and to provide a return to his labour. Lack of profitability in farming has been a problem for several decades in Kent County, and has generally frustrated all other efforts to increase production from a generally adequate land base.

The best use of this land, therefore, comes down not only to a question of soil capability for agriculture, but also to many other factors. This final chapter will examine some of the implications of individual decisions in the aggregate affecting the use and management of the land resource from three perspectives: the local area, the Atlantic region, and the nation.

Perspective of the Local Area

A lengthy history of emigration from Kent County has consistently deprived this part of New Brunswick of one of its most valuable resources, its youth. It has also eaten into community and economic infrastructure, and has depleted a traditionally respected sense of rural values. Those values in Kent County still survive to a degree, for example in the many cooperatives which form an important means of economic endeavour, but there is a general, if intangible, feeling that the sense of community is not as obvious as in former times.

The efforts of an industrious band of farmers, with some assistance from federal-provincial programs such as the Kent County Pilot Project

(DREE), has ensured that a modicum of agricultural prosperity has characterized the remaining farms in the late 1970s and early 1980s. Specialty crops are now grown, demonstrating in some cases a particularly favourable juxtaposition of land quality and climate, and some of the more traditional enterprises have managed, whether by fortune or skills, to grow to an efficient size. In many cases, farmers have found work off the farm to supplement their agricultural endeavours. In most cases, these people are willing to make personal sacrifices from day to day because of a strong attachment to the land.

Specialized production, coupled in some cases with more diversity of production attached to traditional enterprises, offers one means for agricultural growth in Kent County, and therefore one means for reclaiming idle land which is not too far along the path to woodland. Included as a specialty crop could be cultivation of Christmas trees, to provide a valuable export to the large urban markets of the eastern United States.

Providing markets can be identified and penetrated, there is sufficient land of good agricultural capability for crops to be grown over an expanded area, including grains to feed local livestock herds. This would probably require modifications to the Feed Freight Assistance Act to allow local farmers to exploit locational advantages for grain growing and marketing. It would also require an expanded research effort on varieties and strains of feed crops suited to the generally shorter and/or cooler Maritime growing seasons, although a solid foundation has already been established in Atlantic Canada through the experimental stations at Charlottetown, Prince Edward Island, and Nappan, Nova Scotia. A start has also been made on research into forage crops at the Buctouche Experimental Station, and there have been investigations into using cull potatoes (generally those which do not meet export grade standards) as high-energy beef feeds at the Fredericton Research Station (for a summary of these programs, refer to Agriculture Canada, 1981b, 1982c). Results from experiments to date have been promising, and increased adoption of new strains could not only expand the area under various crops, but also allow reclamation of land in Eastern New Brunswick for forage for expanded herds of animals.

Recent experience in cultivating Christmas trees in Kent County also reminds us that trees are the natural vegetation in Kent County, and that forestry for both sawmills and pulp mills is the most important single industry in New Brunswick. Apart from higher-value Christmas tree production, there is ample scope in Eastern New Brunswick for a greatly expanded effort in scientific forestry. This is particularly so as a combination of circumstances and cutting practices throughout the province have resulted in a situation where supplies of fibre to mills is significantly short of demand from those mills, at least during the balance of this century. Provincial forestry policies are already increasingly oriented towards an increase in the cutting of trees from the many small, privately-owned, woodlots in New Brunswick to reduce the shortfall, but there is consensus that prompt silvicultural action is required to assure continuous supplies into the 21st Century (New Brunswick Department of Natural Resources, 1982). From economic, environmental and recreational standpoints, there is little doubt that encouraging tree plantation on much land in Kent County which was previously farmed would be a sensible, if rather longer term, solution to the present underutilization of a valuable resource. This course of action would require extensive coordination to allow economic planting on, and harvesting from, many smaller private woodlots.

Establishment of a healthy rural economy in Kent County, based on agriculture, forestry, and the fishery, will enable some members of a population to stay in the area who would otherwise automatically consider moving away to earn a living. Enhanced effort in all sectors would have a multiplier effect which would result in, and strengthen, associated economic endeavours. This comes at a time when opportunities for work elsewhere in Canada are fewer, and there appears to be growing reluctance on the part of local residents to move away from Kent County to find work. This emphasizes not only the value of the land resource itself, but also a more important resource, human energy.

Perspective of the Atlantic Region

Historically, there have been quite spectacular agricultural success stories in Atlantic Canada, such as apples (1890-1940), potatoes, and more recently, blueberries. Such successes are notable because they generate important export earnings for a region not generally remarkable for its farming industry. The manufacturing employment based on agriculture in the Atlantic region, however, is substantial and has increased over the past two decades as new processing and freezing plants have begun production. There is considerable scope for increasing all agriculture-related sectors in the region, both for regional and export markets, and Eastern New Brunswick could figure quite prominently in such a scheme of things.

Presently, crops grown in the County are sent elsewhere for processing, to the Saint John Valley or the Annapolis Valley in Nova Scotia for fruits and vegetables, to Ontario for tobacco. Eastern New Brunswick is now developing an agricultural base to support its own processing facility. Whether such a food processing facility will be located in Kent County is a moot point. On the one hand, the food-producing area to supply such a plant is generally available locally and could be supplemented with produce from other areas of the Atlantic region. On the other hand, Kent County would be in competition for this type of processing facility with other areas in Atlantic Canada that have a similar, unmobilized agricultural base that serves a relatively limited market, albeit with potential for expansion. The location of a new food processing facility would help to increase and diversify employment opportunities in the county selected, and add to the manufacturing base of the Atlantic region as a whole.

Equally important from a regional perspective is a frustrating inability to become self-reliant in certain commodities, including red meats, most grains, and certain fruits and vegetables. In part this has been a result of not being able to compete with larger scale units of production elsewhere in North America, and this applies particularly in the case of pork and beef. In part, also, there have been institutional barriers to efficient local production, particularly for feed grains where western grain enters the region at subsidized rates under the Feed Freight Assistance Act. A relatively small change in these and other external factors in favour of the Atlantic region would probably benefit Kent County and other similar areas, spurring expansion of the agricultural industry.

Once again, there is scope to diversify resource-based economic activities to enhance performance of the forestry sector in particular. Forestry offers considerable potential for rejuvenation as the malaise which affects woodland in New Brunswick (sadly depleted by bouts of insect infestation and many decades of ill-considered cutting practices) is widespread throughout Atlantic Canada. Recreation and tourism in certain areas would complement agriculture and forestry in supporting the rural economy. The distinctive cultural identity of Eastern New Brunswick has already been recognized in this respect (see Chapter Two).

All these industries (agriculture, forestry, the fishery, and recreation/tourism) are essentially resource-based, and a considerable body of experience has accumulated around them in Atlantic Canada. They also represent opportunities for employment creation based on bigger markets than exist in the region, and expansion of export markets has become an anthem in recent years in Atlantic Canada (see Atlantic Provinces Economic Council, 1983). Such expansion also relates in more subtle ways to overall regional self-reliance.

With respect to agriculture alone, increased self-reliance in Atlantic Canada must form an important part of overall national strategies to maintain and expand food exports. Export-led growth in the agricultural sector is based largely on western grains. In the Atlantic region this translates into supplying more local needs for food. The means to meet this demand will require more land and associated rural infrastructure.

There are other factors which favour increasing regional food production. Energy price increases have meant higher transportation costs. Atlantic Canada is at the very end of North American food supply lines, and there are consequent considerations of freshness and quality. Consumers seem increasingly inclined to put a higher premium on better quality, and are often willing to pay the extra price, or to deal directly with the farmer in buying food. Local production benefits from this trend.

Perspective of the Nation

The land base of Atlantic Canada must also be put under some pressure as the agricultural use of the national land base approaches its limits. The best agricultural land in Canada is already fully accounted for, and is often under severe pressure from urban development. As agricultural production in the western provinces has moved onto lower quality lands, there have been increased climatic risks, and more frequent, and potentially more serious, signs of water shortage (Simpson-Lewis et. al. 1979). Aquifers have been drawn down, organic matter has been lost through intensive cropping and overgrazing, while summerfallow and irrigation have increased soil salinity in some areas (Coote, 1983). Cultivation of these lands will be increasingly expensive, and this in turn puts a premium on the maintenance and use of good land which is underused in other parts of Canada, including Kent County and other parts of Eastern New Brunswick.

In this respect, Kent County must be regarded as an agricultural reserve with significant area of crop producing potential as well as good prospects for forestry developments. Both agricultural and forestry products are most important parts of the Canadian economy; expansion of agriculture is regarded as an essential part of future export growth (Agriculture Canada, 1981a), and protection of thousands of jobs in forestry will require rapid action to sustain supplies of wood flowing to mills.

Growth in food exports must occur as national self-reliance in foodstuffs is threatened. The population of Canada will probably reach 28 million by the end of this century, and we already import some foods which could be produced on better quality land within Canada. Whereas some of this better land (for example in southern Ontario or British Columbia) is under extreme pressures for urban and industrial development, land in other areas (for example in several parts of the Maritimes, including Eastern New Brunswick) has been abandoned for agricultural purposes on a wide scale, with no alternative use other than natural reversion to shrub and forest. To achieve goals of maximum Canadian self-reliance in foodstuffs, and furnishing a surplus for export, will require serious appraisal of all the potential agricultural areas such as Kent County and Eastern New Brunswick. Nevertheless, the place of relatively remote and underutilized farming areas such as Kent County as a small part of broad national and international agricultural markets is open to debate. Regional allocation by the market process may favour further intensification on the best capability lands in southern Ontario and B.C. as more economically viable, while areas such as Kent County would expand only moderately in forage crops, pasture and certain specialty crops.

Afterword: Some Policy Ramifications

Although Kent County is a very small, and not very prosperous, part of the Canadian agricultural scene, the range of crops which can be grown is wide, and there is a lengthy tradition of livestock farming. There also appear to be substantial reserves of agricultural land, some of which has been abandoned recently enough to offer good opportunities for reclamation at relatively little cost. Some problems, however, must be addressed by means of government policies and programs.

Reliable identification, on a scientific basis, of physical limitations to agriculture down to the level of individual farmsteads and fields is needed. Appraisal of land quality would allow farm business planning to proceed from a firm base and would more accurately determine the true potential of the land resource in Kent County. Addressing problems such as this at the level of individual farmsteads would link naturally to developments at other levels (for example, infrastructure development and market development) in the farm-food system.

To a degree, certain issues are already being addressed by means of a variety of federal-provincial initiatives, particularly Agricultural Development Agreements, and the resource programs of the Kent County Pilot

Project. These have attempted to bring individual farm operations to efficient scales by encouraging investment in equipment and buildings. All programs, however, probably need re-examination and re-evaluation in terms of recent structural changes in the agricultural sector in New Brunswick.*

For example, the most substantial single amount of funding in the 1978-1983 Agriculture Development Agreement in New Brunswick was spent on the dairy sector. This sector is undergoing significant rationalization in the early 1980s since overproduction has become commonplace, and demand for fluid milk in particular has been declining steadily. A more careful examination of prospects and markets for other commodities (for example, such as fruits, vegetables and cole crops) may reveal better strategies for spending this money.

Another problem concerns the conservation of existing cleared land of reasonable capability for agriculture. Quite radical steps have been taken in other parts of Canada. British Columbia and Quebec, for example, both have mechanisms to deter the conversion of valuable agricultural land to other uses. Saskatchewan has had considerable experience with land banking, which enabled the Province to buy farms as they came on the market, and lease the land back to working farmers. Amongst other things, this made the inter-generational transfer of farms easier. The cost of this land banking program, however, was cited as a reason for its recent elimination.

Atlantic experience with mechanisms to protect agricultural land has been limited. Newfoundland has adopted means to protect its limited areas of mineral soils, and Prince Edward Island has recognized the importance of agriculture in its provincial economy by a variety of measures to restrict the size of parcels which can be bought by non-residents (Maritime Resource Management Service, 1979). Neither Nova Scotia nor New Brunswick have taken such substantive steps. (For a summary of agricultural land protection mechanisms in Canada, refer to Manning, 1983.)

It is frequently difficult to justify protection for agricultural land in areas where the record of farm profitability has not been good. Usually, it is argued, there are adequate reserves of reasonable quality land to easily accommodate agricultural expansion, when and if it occurs. Competition for land, as well, is not usually perceived as being intense. Conversely, it can also be argued that such a view ignores the cost of clearing the land of trees, and that every measure should be taken to care for land recently abandoned from agricultural purposes. The balance of the twentieth century may well be a time when areas of retreating margins acquire new value as Canada strives to feed its own population, and to export food to parts of the world less able to feed themselves. In such a scheme of things, areas such as Eastern New Brunswick deserve attention before more cleared land reverts to shrubs and trees. Whether or not its food producing potential is mobilized in the immediate future, the lands of Kent County and Eastern New Brunswick, nevertheless, remain as an agricultural reserve of some consequence.

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*Evaluation of the 1978-1983 Agricultural Development Agreement was under way at the time this report was being written.

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APPENDICES

APPENDIX A - Research Methodology

APPENDIX B - Landholder Survey Questionnaire

APPENDIX A: RESEARCH METHODOLOGY

The data-gathering components of the project involved four major sources:

a) a land-use survey;
b) analysis of census data for 1951, 1961, 1971, and 1981;
c) a landholder questionnaire survey; and
d) interviews with personnel skilled and experienced in agricultural matters in Eastern New Brunswick.

The analytical methods used to manipulate data into a suitable form involved extensive use of a computerized mapping system developed by Maritime Resource Management Service. Each stage of the project will be described critically in the following pages, with special emphasis on the innovations tested.

The Land-Use Survey

A survey of cleared land was conducted as a central part of the project. For the study area of four parishes in Kent County, New Brunswick, this survey covered the period from 1963 to 1982. The land-use classification was based on seven generalized classes, intensive agriculture, extensive agriculture, idle cleared land, restocking land (once cleared), urban, recreational, and other land uses (mostly forest). This generalized classification was broadly based on that used in an extensive survey of cleared land in Nova Scotia in 1979-1980. The Nova Scotia survey emphasized the agricultural use of land, and the way this use has changed over the years. (Nova Scotia Department of Municipal Affairs, unpublished, 1979.)

Intensive Agriculture includes orchards, other fruit/berry cultivation (including blueberries), and annual tillage crops which include all horticultural and row crops, grains, and corn. The farm site is also included in this class, as are novel, relatively new "crops" such as Christmas trees.

Extensive agriculture includes hay and pasture, both improved and unimproved, and recently cleared land which is still to be put to identifiable agricultural use.

Idle land is that which has been cleared in the past, whether improved or unimproved, and put to some cultivated or grazing use. This land could more precisely be described as "inactive, with a potential to farm again fairly easily" and runs across a spectrum from still cleared to "lightly restocked" with small trees and bush. The still cleared land is that which shows relatively little evidence of young tree growth, although clumps of dwarf species may have reappeared. The "mid-point" of the class could be described as where these clumps begin to dominate the extensive growth of weed grass species and to obscure the generally smooth microtopography that is characteristic of active farmland. At most, this land could be reclaimed for agricultural activities by use of brushcutter and heavy plough.

Restocking land, or more precisely "inactive farmland, requiring a major effort to bring it back into cultivation", succeeds idle land where tree cover begins to dominate. The land-use class involves consideration of species composition, size and/or density of shrubs and tree growth, and proportion of formerly cleared area covered. It is a transitional part of a natural succession from idle, but still cleared, land which, if not arrested, will revert entirely to woodland after a number of years. Ease of re-clearance and cost to bring land back to production are fundamental criteria.

General urban development includes all land of an urbanized or built-over nature except for recreational use. Nucleated settlements and incidental open space, villages, large industrial, commercial and institutional sites in an otherwise largely rural milieu, and all road and highway rights-of-way form part of this class.

Recreational development includes subdivision for seasonal or occasional dwellings, and a variety of community-initiated developments such as parks and the like. In many cases, recreational subdivisions will only show up on summary maps where concentrations around a feature or along an axis (such as a road) allow sufficient resolution for detection.

Other uses form a residual which comprises the balance of the total of the study area. They are largely forestry uses, with some intermixture of uses such as former and active extraction sites (sand and gravel, other mineral, and peat extraction), and former dwelling sites. These uses were coded only insofar as they were involved in a change to one of the other six land uses.

Mapping was done on a base made of about 80 orthophoto sheets at a scale of 1:10,000. As final summary mapping would be done at smaller scales (1:50,000 and 1:100,000), the smallest area coded on the 1:10,000 sheets was determined on the basis of the resolution that could be maintained at the 1:50,000 scale. This effectively put the lower cut-off point at areas about 70 x 70 mm on the 1:10,000 orthophoto sheets.

For three of the 1:10,000 map sheets, covering different parts of the study area, a much more detailed land-use classification was applied (with 23 instead of seven classes), and covered three years rather than two. An interpretation of 1974 aerial imagery comprised the mid-point year to allow an evaluation of land-use change at a more detailed level to gauge whether the extra effort resulted in appreciably better results. The overall assessment of these more detailed maps is that they do present a much more comprehensive overview of land uses and land-use changes, which would be suitable for detailed planning purposes. The technical labour involved in reaching this stage is, however, much more costly and time-consuming than for the generalized survey.

The classification was applied both to aerial imagery, and by means of a reconnaissance field survey. The latter was necessary as a check to 1982 interpretation where much of the original imagery was on videotapes exposed towards the end of the farming season. Since this was a new approach to the interpretation of aerial imagery (compared to standard interpretation from stereo pairs) the field survey was a necessary verification step. (An evaluation of video imagery for interpretative purposes appears below).

Historical vertical photography exists for Kent County at a scale of 1:15,840 from 1963. This formed the basis of the land-use survey, with 1982 imagery used to update the field-pattern established from 1963. As fields were identified on the 1963 photographs, they were assigned a code to denote use in that year. The fields included those which were not actually interpreted as being in active agricultural use, but which were identifiably farmed at some stage in the recent past.

The two classes of "idle" and "restocking" land which were used to classify these old fields, in hindsight, contain a built-in danger. Although old fields may have reverted to woodland in almost every sense of the word, formerly cleared areas can usually be identified by tracing quite distinct field lines on aerial photographs. (Old fields show up even more distinctly if false-colour infra-red imagery is used.) Areas classified in this way in 1963 may have been abandoned up to several decades earlier, (i.e. in the 1940s). Once classified on the 1963 base, however, they must also be classified for 1982. In this way, areas of reverting fields become inflated in later analysis.

Initial compilation of 1963 land-use codes was done on an overlay of each of the 1:10,000 orthophoto maps in the study region. Updating of uses in 1982 was carried out, and a second code assigned to each field to reflect the updated use, by using a variety of media:

a) A series of video tapes were obtained by flying the study area in September, 1982, and used for land-use interpretation;

b) Some 1982 vertical stereo imagery became available during the course of the project. As these 1:10,000 photographs were issued, they were used for interpretation. In some more limited areas, recent false-colour infra-red imagery, at smaller scales, was used for checking purposes; and

c) Data from the reconnaissance field survey were also used for checking purposes.

The video imagery, an innovative medium in this kind of analysis, requires a little more attention.

Appraisal of Video Imagery for Land-Use Monitoring

At the outset of the project, it was decided to test video imagery for land-use interpretation because:

a) It is less expensive, and could be obtained in a shorter time after actual flying, as less tape processing time and no printing time, is required;

b) Only the relevant areas would be flown, rather than uniform, 100 percent coverage usual with conventional vertical imagery. In this case, efforts were concentrated on major road system as the main axes of cleared areas.

The disadvantages of video imagery for detailed interpretation were seen as lack of resolution of the image; and lack of stereo pairs. Interpretation was done from television monitor as opposed to a stereoscope as is usual with vertical pairs.

Initial difficulties involved the scale of the imagery (mean height above the ground). An original scale of 1:15,000 was tested and rejected because of low resolution on final video tapes. A final scale of 1:7,500 was chosen which covered all but those parts of the fields most distant from the road, which were easily covered as part of the reconnaissance survey. This worked well in the study areas as fields are heavily concentrated in a linear pattern along roads. In areas where clearing has occurred at greater distances from the road or where clearing is less evident for whatever reason, a more comprehensive photographic coverage will be necessary.

In addition, a spacial mount had to be designed and installed in the aircraft to carry the camera. This allowed for sideways drift of the aircraft, and kept linear features (in this case, roads) in the centre of the monitor at all times. This mount is useful for other jobs, such as flying for coastal and shore line mapping. Testing the video imagery for actual interpretation involved comparison with interpretation of high-resolution vertical stereo photographs. As applied to the generalized land-use classification, results were mixed and are briefly outlined below (Refer to Table 1.1 for land-use classification; the land-use codes below correspond to those in the table).

A. Intensive Agriculture. For annual tillage, the video imagery is quite consistent for interpretive purposes except if flown during the early crop-growing season. In a similar vein, tree plantations are evident if due consideration is given to location vis-à-vis roads, tree size, and layout of rows. Orchards of more than twenty trees stand out as do the colour and texture of blueberry fields and other areas of small fruits. Smaller orchards, such as those beside farm houses, are not always so evident. Location of farm sites is usually quite evident, but the resolution will not allow positive identification, particularly if close to an urban area.

B. Extensive Agriculture. Because of resolution, it becomes very difficult to distinguish between hay and pasture and land which is idle or in the early stages of restocking. Newly cleared land is evident only if the clearing was recent, and even then could easily be mistaken for sand and gravel extraction.

C. Inactive, could be reclaimed for cultivation fairly easily. This class involves a resolution problem as it could be mistaken for hay or pasture.

I. Inactive, requiring major effort to reclaim for cultivation. Land which is lightly restocking with trees may be mistaken at one end of the spectrum with hay, pasture, or idle, and at the other end of the spectrum the distinction between "light" and "heavy" restocking can be confusing. Land which is heavily restocked with trees may be overlooked as woodland on video images.

R. General Urban Development. Residential dwellings are quite evident, but may be mistaken for cottages (recreational subdivision), and farm sites. Some kinds of commercial development (for example, a gas station) and institutional development may not be distinguishable from general urban development. Urban core and transportation developments are very distinguishable.

P. Recreational Development. It may be difficult to distinguish isolated dwellings and out-buildings from cottages.

Recreational site activities could be mistaken for commercial, transportation, or institutional land uses.

Other land uses. Most land uses in this residual class are easily identifiable from video imagery, although fine detail on some classes (for example, extractive activities) is difficult. As already mentioned, however, forested areas may not always be distinguishable from heavily restocked land.

It is evident that there are negative points regarding interpretation from video imagery for most of the preceding land-use coding classifications. By application of accumulated experience and skills, however, some very important basic interpretive aids emerge which greatly enhance the overall value of video imagery. In particular, video imagery can play an important role in updating land-use maps, particularly if used in conjunction with other conventional photography, as was the case in this project. Video imagery alone may not replace conventional photography, but it would certainly be an efficient means of updating an area rapidly and economically.

The problem of overall low resolution remains. In this context, however, this project was done using a rather low-cost video camera with a resolution of 200 horizontal TV lines. A camera with a resolution of 500 horizontal TV lines would improve the interpretive capacity.

Manipulation of Area Data

Compiled overlays, with two land-use codes for each unit of area, underwent a lengthy process of entry into the computer system. The sequence involved digitization, editing of digitized information, assignment of attribute files (including one file which assigned soil capability for agriculture in addition to the two files with basic land-use interpretations for the two years), and final plots of maps and area tabulations.

The computer prepared maps at three basic scales:

a) Each 1:10,000 orthophoto map was processed for each of the two years of interpretation, plus a third map which showed land-use changes between the two years;

b) The orthophoto maps were amalgamated into a series of summary maps, in four colours, at 1:50,000; and

c) A series of maps were plotted at 1:100,000 in monochrome which depicted certain selected trends and changes.

Although much work was done on maps at 1:10,000, actual plotting was completed at the 1:50,000 and 1:100,000 scales.

The MRMS Geo-Base System: A Note

The equipment included in the MRMS Geo-Base System is arranged in a modular structure, which includes an input station as well as analysis and output stations. The programs used to manipulate the data allow many aspects of cartographic flexibility such as scale changes, overlays, shade mapping, and attribute file creation.

There is a danger, which appeared at various points of this project, that a package of sophisticated software, coupled with land-use data on some 22,000 individual polygons (representing as many fields, or amalgamation of adjacent fields on the ground) can overtax a relatively small machine. Project design should allow careful consideration of machine and operator time. In particular, different series of final plots and tables, including scales, numbers of separate map sheets to a study area, and thematic content of the maps, deserve special attention well in advance of actual data manipulation and final plotting.

Recently surveyed soils information (from 1982) was the only non-primary data overlaid with the land-use information. This was done only for cleared areas to give an indication of the quality of land used for various uses, especially that which was still being farmed and that which was idleor restocking in trees. As the soils information was plotted at the 1:10,000 working scale from 1:50,000 maps provided by federal and provincial soil scientists in Fredericton, the change of scale means that resolution for analytical purposes was somewhat coarsely-grained. Rough data in tabular form were derived, but no maps were plotted.

Census Investigation

To form a foundation for the project, data from the 1951, 1961, 1971, and 1981 Censuses of Agriculture were abstracted and recompiled at three different levels. (In a few cases, data earlier than 1951 were used). The three levels of investigation were:

a) Atlantic Canada (Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick);

b) Eastern New Brunswick (Gloucester, Northumberland and Kent counties, corresponding to Census Divisions of the same names); and

c) Kent County (all census subdivisions in addition to the four subjected during the study to more intense investigation; analysis of data at the census subdivision level (corresponding to parishes in New Brunswick) was rejected because of the limited number of variables available at the subdivision level in published form, and because some data for two different sub-divisions had been combined in later censuses due to confidentiality restrictions under the Statistics Act).

The description and analysis of census variables is found in Chapters 2 and 3.

Landholder Interview Survey

Statistical information provides the measuring rod to document changes and trends. The reason for these changes involves more detailed investigation of the individual experiences and perceptions of people living on the land in Eastern New Brunswick.

A detailed questionnaire was designed and administered to a total of 27 landholders in the study area. This was not, it should be emphasized, a random sample. Interviewees were selected from lists compiled during surveys in 1979 and 1980 by the New Brunswick Department of Agriculture and Rural Development. At least two representatives of all major types of farming in Kent County (both full-time and part-time) were included in the survey as well as people not actively farming their land. The major types of farming represented in the survey were dairy cattle, beef cattle, hogs, poultry, field crops (forage, grains and potatoes), fruits and vegetables, and miscellaneous specialty crops, including tobacco.

Potential respondents were contacted in the period December 1982 - April 1983 and the questionnaire was administered at their home. The questionnaire included five major sections:

a) property and land use;
b) land-use change and property management;
c) local services and local economy;
d) the future; and
e) respondent characteristics.

The questionnaire is included as Appendix B. It comprises a mix of closed questions which allowed for direct comparison, and open-ended questions which allowed examination of ranges of attitudes and actions. Data for the questionnaires were compiled and analysed by hand. Results have been incorporated in the various sections of the report.

It is worth noting that individuals responding to the questionnaire were courteous, interested, and extremely helpful. In part, this can be attributed to the survey being conducted in winter, but it also reflects genuine concern on the part of respondents over the land-use and agricultural problems that the project addressed.

A limited non-random sample is, nevertheless, not a perfect substitute for a larger, randomly-generated sample since measures of statistical significance are sacrificed. In addition, manipulation of small bodies of data by hand may be less expensive than using standardized computer programs, but there is much less flexibility in terms of cross-classification of survey results.

This is not to say that results from the present survey are not meaningful. The survey allows evaluation of a range of problems and the decisions and strategies adopted to tackle these problems. This valuable information can be obtained for landholders at relatively little cost, although care must be taken in interpreting the results. Definite trends emerged during the survey.

Interviews with Knowledgeable Personnel

Landholder experiences and insights, as obtained for the questionnaire survey, were supplemented and complemented by a second series of interviews. A variety of experienced personnel with a wide range of skills and experience in the field of agriculture and land use in Eastern New Brunswick were contacted and interviewed. Although less structured than the questionnaire survey, a great deal of information was elicited by this method on a wide spectrum of land-based rural activity in Eastern New Brunswick.

The different people interviewed included provincial and federal agricultural representatives, credit officials, land-use management experts, agricultural engineers; representatives of farmers' organizations; planning officials; managers of cooperatives; educational specialists; and so on. Many of these people were born and bred in rural Kent County, and kept in close touch with the family farm. As with the landholder survey, people were almost unfailingly polite and interested in the project and rural Kent County.

This part of the project was designed to be more flexible than the questionnaire survey. Certain major topics for discussion were maintained, but as the project proceeded, the number of topics was modified. In addition, the interviewee's particular area of expertise and experience was emphasized. For example, credit managers were asked about conditions surrounding credit availability over the past few years, while local planners were asked about competing demands for land. The initial set of topics to guide discussion included questions on scale of enterprise, markets, farmer skills, competition for land, and individual aspirations and attitudes. The interaction of various topics and potential sources of information are shown in Table 1.2. It was not possible to contact representatives of all the groups in the matrix, but at least one representative of most groups was interviewed. Some were contacted several times. A list of these contacts is found in the Acknowledgements.

Methodology: Overall Evaluation

The methodology was designed to be flexible, to adapt to localized sources of information and the time available for data-gathering and analysis. It combined observation of physical features (the land-use survey) with research of primary and secondary socioeconomic information to give a solid and comprehensive picture of the land resource base and its use in an area. The analysis of rural land-use and associated socioeconomic change crossed a broad spectrum of analytical methods drawn from both social and physical sciences. When coupled to a wide range of more subjective insights and experiences, derived partly from a questionnaire survey, partly from interviews with a range of knowledgeable personnel, the depth of findings was sufficient to allow assessment of the causes and evaluation of the consequences of land-use change. In summary, base data in the form of a land-use survey and socioeconomic statistics from the Census are essential to determining the patterns and trends of land-use change in a study area. More subjective methods may then be employed to clarify and explain the patterns and trends found in the empirical data.

APPENDIX B

KENT COUNTY, NEW BRUNSWICK

MARGINAL LANDS LANDHOLDER QUESTIONNAIRE

PART ONE: QUESTIONNAIRE IDENTIFICATION (To be completed after interview)

1. Type of respondent
   - ☐ 1. Single owner
   - ☐ 2. Joint family owners
   - ☐ 3. Partnership
   - ☐ 4. Lessee
   - ☐ 5. Other (specify) ____________

2. Person(s) interviewed
   - ☐ 1. Male
   - ☐ 2. Female
   - ☐ 3. Husband and wife
   - ☐ 4. Group, partners, etc.
   - ☐ 5. Other (specify) ____________

3. Date of interview ____________________________

4. Location of property sampled

Parish ____________________

Community ____________________

Lot ____________________

Orthophoto Sheet ____________________

INTERVIEWER'S ASSESSMENT

Total Management Unit Size ______________

PART TWO: PROPERTY AND LAND USE

5. Do you own any land in Kent County ?

☐ Yes ☐ No - jump to Question 8

If yes

What is the total area owned ? __________ acres

How much is open or cleared ? __________ acres

How much cannot physically be used for crops or pasture ? (too wet, steep, rocky, etc.) __________ acres

If any, why can it not be used ?

---

6. In which year did you first acquire any of the land you now own in Kent County?(rough dates are o.k.)

__________ year __________ can't recall

7. Do you lease any property to other users?

☐ Yes ☐ No - proceed to next question

If yes

How many acres are leased ? __________ acres

How long is the term of the lease ? __________ years

What is the land primarily used for by the lessee ?

---

8. Do you lease any land from someone else in Kent County ?

☐ Yes ☐ No - proceed to next question

If yes

How many acres do you lease ? __________ acres

How long is the term of the lease __________ years

How much of the leased land is open or cleared ? __________ acres

How much cannot physically be used for crops or pasture ? (too rocky, wet, steep, etc.) __________ acres

If any, why can it not be used ?

9. Which of these uses occur on your land in Kent County ?

☐ 1. Commercial farming
☐ 2. Non-commercial farming - jump to Question 11
☐ 3. Residential
☐ 4. Commercial non-farm activities - proceed to next question
☐ 5. Vacant land - jump to Question 15
☐ 6. Forestry - jump to Question 14
☐ 7. Other - please specify

---

10. What commercial non-farm activities occur on your land ?
How many acres are occupied by each ?

Commercial Activity	Acres

11. Do you have any crops, pasture, livestock or poultry (in 1982) ?

☐ Yes ☐ No - jump to Question 14

If yes - What is the main farming enterprise ?

---

12. Do you farm your land full-time, part-time or not at all ?

☐ Full-time - proceed to next question
☐ Part-time

If part-time, why ?

☐ Not at all

13. What crops or type of pasture did you have in 1982, and how many acres were used for each ? (differentiate improved and unimproved pasture)

Crop or Pasture Type	Acres

14. What livestock or poultry do you have, and what are the numbers of each ?

Livestock or Poultry Type	Numbers

15. Do you have a woodlot on your land ? (owner or leased)

☐ Yes ☐ No - proceed to next question

If yes - How many acres of woodlot ______ acres

What are your plans for the woodlot ?

Did you derive any income from this woodlot in 1981 ?

☐ Yes ☐ No

If yes - What was the percentage of your family income derived from the woodlot ?

______ % proceed to next question

16. Do you have any unused land ?

☐ Yes ☐ No - proceed to next question

If yes How much land ? ____________ acres

Why is it unused ?

____

____

____

To your knowledge, was this land ever used ?

(If yes, specify use) ______________________________

____

17. (a) Do you consider your land to be good, fair, or poor for agriculture, or to have no agricultural capability ?

☐ 1. Good for agriculture
☐ 2. Fair for agriculture
☐ 3. Poor for agriculture
☐ 4. With no agricultural capability
☐ 5. Extremely variable
☐ 6. Don't know

(b) Do you know what class your land primarily is ?

☐ Yes ☐ No - proceed to next question

If yes, what class or classes is your land ?

____

____

(c) Are you aware of the existence of land capability maps at the Canada Land Inventory ?

☐ Yes ☐ No

18. Are there any physical limitations on the use of your land for forestry ?

☐ Yes ☐ No - proceed to next question

If yes What are these limitations ?

____

____

19. If you were to sell all of your property today, what value would you put on it ? (in $ per acre, including all structures and improvements but not livestock)

$ ____________/acre ____________Don't know

20. Have there been any potential buyers for your property during the past 5 years ?

☐ Yes ☐ No - proceed to next question

If yes What did the buyer intend to use the property for ?

____

____

21. a. Please indicate which of these reasons for owning or leasing land were important to you when you first acquired this land ?

b. What reasons are important now ?

c. What reason is most important now ?

	CHECK AS MANY AS APPLY At First	Now	CHECK ONE ONLY Most Important Now
1. Making a living	☐	☐	☐
2. Recreation	☐	☐	☐
3. Investment	☐	☐	☐
4. Residence/Shelter	☐	☐	☐
5. Lifestyle	☐	☐	☐
6. Retirement	☐	☐	☐
7. Desire to own land	☐	☐	☐
8. Inheritance	☐	☐	☐
9. Other -please specify	☐	☐	☐

____

PART THREE: LAND USE CHANGE AND PROPERTY MANAGEMENT

(We would now like to look at any changes that may have been made to your land use, and the reasons for any changes.)

22. Can you tell us the use of this property in 1982 ? 1971 ? 1961 ?

1982 Use ______________________

☐ Don't know

1971 Use ______________________

☐ Don't know

1961 Use ______________________

☐ Don't know

23. a. Please indicate if any of these changes have been made on your land ?

b. When did they occur ?

c. Do you anticipate any of these changes in the next five years ?

		1961-71	1971-82	1982-87
1.	Splitting of land	☐	☐	☐
2.	Severance of house site	☐	☐	☐
3.	New residence	☐	☐	☐
4.	New farm buildings	☐	☐	☐
5.	Fencing of unfenced areas	☐	☐	☐
6.	Fence removal	☐	☐	☐
7.	Woodlot clearance	☐	☐	☐
8.	Woodlot planting	☐	☐	☐
9.	Drainage (field, swamp, etc.)	☐	☐	☐
10.	Farm pond construction	☐	☐	☐
11.	Field abandonment	☐	☐	☐
12.	Gravel extraction	☐	☐	☐
13.	Bulk handling installation	☐	☐	☐
14.	Major machinery acquisition	☐	☐	☐
15.	Other - please specify	☐	☐	☐

____

24. Have you bought, sold, leased or otherwise changed the amount of your land since 1976 ?

☐ Yes ☐ No - proceed to next question

If yes, what have you done ?

1. Bought __________ acres for ☐ 1. Farm
2. Sold __________ acres for ☐ 2. Recreation, cottage, etc.

☐ 3. Residence

☐ 4. Commercial

☐ 5. Industrial

☐ 6. Other - please specify

____

3. Leased __________ acres from other

__________ acres to others

4. Other - please specify

____

Why did you alter your holdings ?

____

____

25. Have there been any major changes in your land use since 1971 ?

☐ Yes ☐ No - proceed to next question

If yes, What changes were made ?

____

____

Why were these changes made ?

____

____

26 What is the most recent activity __added__ on your land ? (new crop, commercial activity, etc ?

Why was this added ?

What is the most recent activity dropped ?

Why was this dropped ?

27 Are you aware of any government services, regulations, or other programs which have affected you __or__ your land use in recent years ?

☐ Yes ☐ No - proceed to next question

If yes, What services or regulations ?

How have you or your land use been affected ?

28 Has the value of this land changed greatly since 1976 ? If so, how has it changed ?

☐ 1 Up greatly
☐ 2 Up a little
☐ 3 Remained the same
☐ 4 Down a little
☐ 5 Down greatly
☐ 6 Don't know

Put further volunteered information here

29 Has there been any major change in input costs or market prices for produce which have caused you to alter your activities on the land in the past five years ?

☐ Yes ☐ No - proceed to next question

If yes What changes in your __activities__ were caused ?

By __what changes__ in costs or prices ?

30 Have there been any innovations or new practices which have caused you to change your use of land or your activities in the past five years ?

☐ Yes ☐ No - proceed to next question

If yes What innovations ?

What changes in your land use resulted ?

Why did you adopt this innovation or change ?

31 Have you been able to obtain financing to make any needed improvements to your property ?

☐ Yes ☐ No - proceed to next question

Any comments ?

12 What are the major problems associated with trying to make a living on the land in this region ?

PROBE (Some possible responses are remoteness, poor land, poor services, declining local economy, people leaving area, etc.)

PART FOUR LOCAL SERVICES AND THE LOCAL ECONOMY

13 If a farm, to whom do you sell the bulk of your produce ?

Neighbours, locally ☐ ______
Marketing agency ☐ Who ? ______
wholesalers ☐ Who ? Where ? ______
Local processor ☐ Who ? Where ? ______
Other ☐ Who ? Where ? ______

14 Has the way you market your produce changed substantially in the past decade ?

☐ Yes ☐ No - proceed to next question

How has it changed ?

Why has it changed ?

15 Do you receive any farm subsidies ?

☐ Yes ☐ No - proceed to next question

If yes How has it changed ?

16 Has access to the following facilities and services changed greatly in Kent County during the past decade (or since you acquired this property) ?

	No Services	Worse	Same	Better
Transport facilities	☐	☐	☐	☐
Local processors	☐	☐	☐	☐
Farm supplies (fertilizer, seed, feed, etc.)	☐	☐	☐	☐
Veterinary services	☐	☐	☐	☐
Machinery dealers or repair	☐	☐	☐	☐
Hardware and fencing	☐	☐	☐	☐

36 continued

	No Services	Worse	Same	Better
Credit services/advice	☐	☐	☐	☐
Farm extension/advice	☐	☐	☐	☐
Farm-related training programs	☐	☐	☐	☐
Community services (schools, libraries, churches, etc.)	☐	☐	☐	☐
Retail stores	☐	☐	☐	☐
Other - please specify	☐	☐	☐	☐

Do you have any comments or changes in any of these facilities or services ?

37 What are the main problems or constraints to the efficient operation of your land using enterprise (farm, lumbering, etc.) ?

38 Do you belong to any Farmer's organization?

☐ Yes ☐ No - proceed to next question

If yes How does this organization assist you in your business ?

39 Are you a member of a co-op ?

☐ Yes ☐ No - proceed to next question

If yes Name of co-op ?

40 What are the major opportunities for employment within the rural areas of Kent County ?

41 Must young people leave Kent County to find real opportunity ?

☐ Yes ☐ No - proceed to next question

Comments ?

42 Do you think the rural economy of Kent County has declined, remained the same or expanded over the past decade ?

Declined ☐ In what way ?

Remained the same ☐ Go to Question 43

Expanded ☐ In what way ?

What are the main causes of this decline/expansion ?

If decline, what can be done to reverse the decline ?

43 Many of your neighbours in Kent County have left the land over the past decade. Why have you remained ?

PART FIVE THE FUTURE

(We would now like to turn to your view of the future of your land and your thoughts concerning future problems that may be encountered in this area.)

44 Do you expect this property to remain in your family, to be sold, or what ?

☐ 1 Remain in family
☐ 2 To be sold
☐ 3 To be abandoned
☐ 4 Other - please specify ____________________
☐ 5 Don't know

45 a) Within the next five years, do you anticipate changing the size of your land holdings ?

☐ Yes ☐ No - proceed to next question

If yes How do you anticipate changing ? (how much)

1 Increasing by __________ acres
2 Decreasing by __________ acres

Why do you intend to do this ?

____
____

b) Within the next five years, do you anticipate making any major changes or improvements in the use of your land ?

☐ Yes ☐ No - proceed to next question

If yes What changes or improvements ?

____
____

46 Do you foresee any major land problems in this area in the next five years ?

☐ Yes ☐ No - proceed to next question

If yes What problems ?

____
____

47 Are you satisfied with your standard of living ?

Very satisfied ☐)
Satisfied ☐) - proceed to next question
Neutral ☐)
Unsatisfied ☐
Very unsatisfied ☐

If unsatisfied, what changes are required ?

____
____
____

48 If you received an extra $10,000 windfall today, what would you use it for ?

____
____

PART SIX RESPONDENT CHARACTERISTICS

(To finish this questionnaire, we would like to ask you some things about yourself, your family and your occupation. This information is needed to differentiate the land use characteristics of, say, people who are young and just starting out, and those who may be approaching retirement, and to enable us to relate land use to such things as off-farm or secondary occupations or the amount of labour employed on the land.)

49. In which of these age brackets do you fall ?

☐ 1. Less than 20
☐ 2. 20-29
☐ 3. 30-39
☐ 4. 40-49
☐ 5. 50-59
☐ 6. 60-69
☐ 7. 70 and over

50. Have you, or anyone else living with you, had any special courses related to the management of your land (agriculture, forestry, management) ?

☐ Yes ☐ No - proceed to next question

If yes, what courses ?

____

____

51. What is your primary occupation ?

____

____

(If necessary for clarity) would you please tell us some details about your work ?

____

____

---

52. Do you have any other or secondary occupations ?

☐ Yes ☐ No - proceed to next question

If yes What are your secondary occupations ?

1 ______________________________
2 ______________________________
3 ______________________________

What percentage of your time do you devote to secondary occupations ? __________ %

What percentage of your total family income derives from your secondary occupation _____ %

53. What percentage of your total family income derives from your land in the Kent County ? _____ %

54. Do any family relatives work on this land ?

☐ Yes, with pay ☐ Yes, without pay ☐ No

55. Do you employ anyone else full-time, part-time, or seasonally on this land ?

☐ Yes ☐ No - proceed to next question

If yes How many are full time ? __________
How many are part-time ? __________
How many are seasonal ? __________

What do you use employed labour for ?

____

56. Generally, what do you see as the long term future of your land in this area ?

____

____

____

____

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